



AHMEDABAD SANITATION ACTION LAB

under the  
URBAN WATER AND SANITATION FOR HEALTH (URBAN  
WASH ALLIANCE)

# READY RECKONER OF DESIGN GUIDELINES

FOR WATER AND SANITATION FACILITIES IN  
MUNICIPAL SCHOOLS  
OF AHMEDABAD

Prepared by  
Urban Management Centre

August 2015



**USAID**  
FROM THE AMERICAN PEOPLE



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GOVERNMENT OF GUJARAT



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URBAN MANAGEMENT CENTRE

*Photographs and graphics are by Urban Management Centre unless otherwise mentioned.*



The **Ahmedabad Sanitation Action Lab (ASAL)** is a 3 year action research (2014-2017) for finding and implementing innovative solutions to school sanitation and sanitation problems in slums and slum-like settlements of Ahmedabad, in coordination with the government, NGOs and corporate partners. ASAL is led by Urban Management Centre (UMC) in partnership with Government of Gujarat (GoG) and the Ahmedabad Municipal Corporation (AMC). The program is supported by the United States Agency for International Development (USAID). ASAL's resource partners include Sintex Industries Ltd. (Sintex) and its associate partners include Mahila Housing Trust (MHT), MICA and Theatre Media Centre (TMC). The program provides technical assistance to the AMC for strengthening community engagement, improving operational and management processes for provision of water-sanitation services, and designing a targeted behaviour change communication campaign.



The **Urban Management Centre (UMC)** is a women promoted not-for-profit organization, that works towards professionalizing urban management in India and worldwide. UMC provides technical assistance and support to city governments and facilitates change through peer-to-peer learning processes. It enhances the capacity of city governments by providing expertise and ready access to innovations on good governance implemented in India and abroad. It facilitates city governments to design, implement and evaluate municipal development and management projects. UMC extensively works in the areas of urban water and sanitation, heritage management, urban planning, urban health, municipal finance, urban management, urban transportation and institutional restructuring. More details on [www.umcasia.org](http://www.umcasia.org)

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# TABLE OF CONTENTS

Sr. No	Chapter	Slide no
1	ABOUT AHMEDABAD SANITATION ACTION LAB	6
2	NEED FOR DESIGN GUIDELINES FOR WASH INFRASTRUCTURE	7
3	DESIGN CONSIDERATIONS FOR WATER-SANITATION FACILITIES	9
4	NORMS FOR ADEQUACY OF WATER-SANITATION FACILITIES	10
5	ESSENTIAL HARDWARECOMPONENTS FOR TOILETS	11
6	ESSENTIAL HARDWARE COMPONENTS FOR OTHER WASH INFRASTRUCTURE	12
7	ANTHROPOMETRIC CONSIDERATIONS FOR CHILDREN ( 5 TO 15 YEARS )	13
8	DESIGN GUIDELINES: TYPICAL TOILET CUBICLE	14
9	DESIGN GUIDELINES: TOILET CUBICLE FOR CHILD WITH SPECIAL NEED	17
10	DESIGN GUIDELINES: BOYS' URINAL	20
11	DESIGN GUIDELINES: DRINKING WATER STATION	21
12	DESIGN GUIDELINES: HANDWASH AND DISH WASHING STATION	23
13	A FILM ON SENSITISING DECISION MAKERS	24



AMC	Ahmedabad Municipal Corporation
ASAL	Ahmedabad Sanitation Action Lab
BIS	Bureau Of Indian Standards
CSR	Corporate Social Responsibility
CWSN	Child With Special Need
GWA	Gujarat WASH Alliance
IS	Indian Standard
SSA	Sarva Shiksha Abhiyan
TMC	Theater Media Centre
UMC	Urban Management Centre
WASH	Water, Sanitation And Hygiene
WC	Water Closet

# ABOUT AHMEDABAD SANITATION ACTION LAB

The Ahmedabad Sanitation Action Lab (ASAL) is an action-research program for finding and implementing innovative and inclusive solutions to urban sanitation problems in slums and slum like settlements of Ahmedabad. ASAL intends to address the health of the citizens through improved water and sanitation. Municipal schools will be at the core of the intervention by introducing students to concepts of water-sanitation and hygiene (WASH). Students will become the ambassadors of change and will bring WASH learning to their homes and neighborhoods. ASAL will be piloted in select areas of Ahmedabad. Lessons from the program will be disseminated to other cities across Gujarat and India. ASAL is envisaged as a resource pool of valuable lessons learnt in water sector.

The program aims to provide hands-on technical assistance, strengthen community engagement, improve operational and management processes for provision of water-sanitation services and design a targeted behavior change communication campaign. A Gujarat WASH Alliance (GWA) will be formed and operationalized over the program period which along with public and private sector partners will house and disseminate the learning from ASAL and from other initiatives from across the Globe.

This slide deck is a ready reckoner for design guidelines of WASH infrastructure in municipal schools of Ahmedabad.



# NEED FOR DESIGN GUIDELINES FOR WASH INFRASTRUCTURE

Based on the understanding of governance of municipal schools in Ahmedabad, most of the existing toilets in municipal schools have been constructed by the Ahmedabad Municipal Corporation or recently under the Sarva Shiksha Abhiyaan.

Since the last one year, with increased CSR funding into improvements in municipal schools, YUVA Unstoppable, a volunteer based organization has also been making improvements and refurbishing existing toilets.

New toilets in municipal schools are entirely financed and constructed by the SSA as per their guidelines and norms. These norms are comprehensive, however the site specific modifications and amendments are based on discretion of the contractor and the school principal. Based on a recent survey that UMC conducted in 175 school campuses of the city, design issues, emerged as one of the key determinants to well functioning toilets.

The pictures here detail out the issues in various campuses. Looking at the initiatives undertaken by the Sarva Shiksha Abhiyaan and Yuva Unstoppable to construct/refurbish toilets, it was felt to develop a ready reckoner comprising of basics of design considerations for WASH infrastructure. This reckoner includes details and design guidelines prescribed under the SSA guidelines but also provides additional details which are not included in SSA but are critical for efficient maintenance of school toilets.



Day lighting issues



Inappropriate slope and proper drainage

# NEED FOR DESIGN GUIDELINES FOR WASH INFRASTRUCTURE



Fixtures not placed at child-accessible heights

No compliance with CWSN standards



Fixtures not placed at child-accessible heights



Inappropriate height and size of sanitation fixtures

# DESIGN CONSIDERATIONS

## DESIGN PRINCIPLES FOR WASH INFRASTRUCTURE

- To encourage children to have more water, it is essential that the toilets are accessible and in good working condition.
- To avoid health problems, children be allowed to use the toilet facility at any time.
- The toilet be designed to a high standard of quality to encourage children respect and thereby minimize vandalism.
- For hygiene purposes, the drinking water facilities be separate from the toilet facilities.

## PLANNING AND COORDINATION OF TOILETS

- Toilet blocks to be located within common circulation spaces without compromising on the privacy of the toilets.
- Planning of toilets to ensure, that only hand-wash area is visible from the circulation spaces.
- Toilet blocks to be configured in small blocks instead of large ones for ease of access from classrooms. Small blocks increase opportunity of passive supervision and reduces travel time from classroom for the children.
- Planning of the toilet to provide for Children with Special Needs (CWSN). Ease of access for students on wheelchair/ crutches.
- Drinking water facilities to be separate from the toilet zone and be in the common circulation space.
- It is preferred that separate restrooms for staff and visitors be created near the staff rooms.
- Provision for janitors' room to be incorporated. This is required for storage of cleaning equipment like brooms etc along with cleaning detergents. The location to be in proximity of both the Girls' and Boys' toilet.



## DESIGN PRINCIPLES

- To encourage children to have more water, it is essential that the toilets are accessible and in good working condition.
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- The toilet be designed to a high standard of quality to encourage children respect and thereby minimize vandalism.
- For hygiene purposes, the drinking water facilities be separate from the toilet facilities.

## ADEQUACY OF AMENITIES

- Provision of amenities should be based on requirements and as per IS code norms

## EASE OF ACCESS, UNIVERSAL AND INCLUSIVE

- WASH infrastructure should be child friendly and designed keeping in mind that child is the primary user
- should be accessible throughout the year.
- Should be such that it can be used by all-children, CWSN and teachers
- Address special needs for girls and lady teachers

## EASE OF MAINTENANCE

- Should be built such that it does not require high maintenance. Finish and specifications should be such that require low maintenance.
- Provision of adequate slopes and direction so that water does not stagnate and floors remain dry

## PRIVACY

- Should have separate toilets for girls and boys with separate entry to ensure privacy.
- Design may have common walls between the girls and boys toilets, but most private spaces may not be along the common wall.



## DAYLIGHTING AND ARTIFICIAL LIGHTING

- Ensure provision of adequate day lighting by providing ventilators with opening size of a minimum 0.5m(H) x 0.9m(W). The ventilator to be made of cement Jali or MS louvers with perforation percentage of 50%. Each ventilator to have MS Fly mesh installed, to avoid mosquitos.
- Lighting levels of 150 lux to be achieved. This can be achieved by using one 13-18W CFL lamp/ 6 sqm of area.
- Recommended light fixtures are LED lamps and in case of unavailability of the same CFL lamps to be used. These provide savings in electricity costs.

## VENTILATION

- Minimum two window openings to be provided on opposite walls to ensure cross ventilation.
- Installation of exhaust fan (if costs permit) would improve air circulation and reduce foul air and humidity content within the toilet.
- Toilet complex to be located in a manner that the foul air from the toilets don't circulate within the public areas of the school complex.
- The ventilators to be located above 7 feet (2.1m) height to provide privacy to the toilet spaces

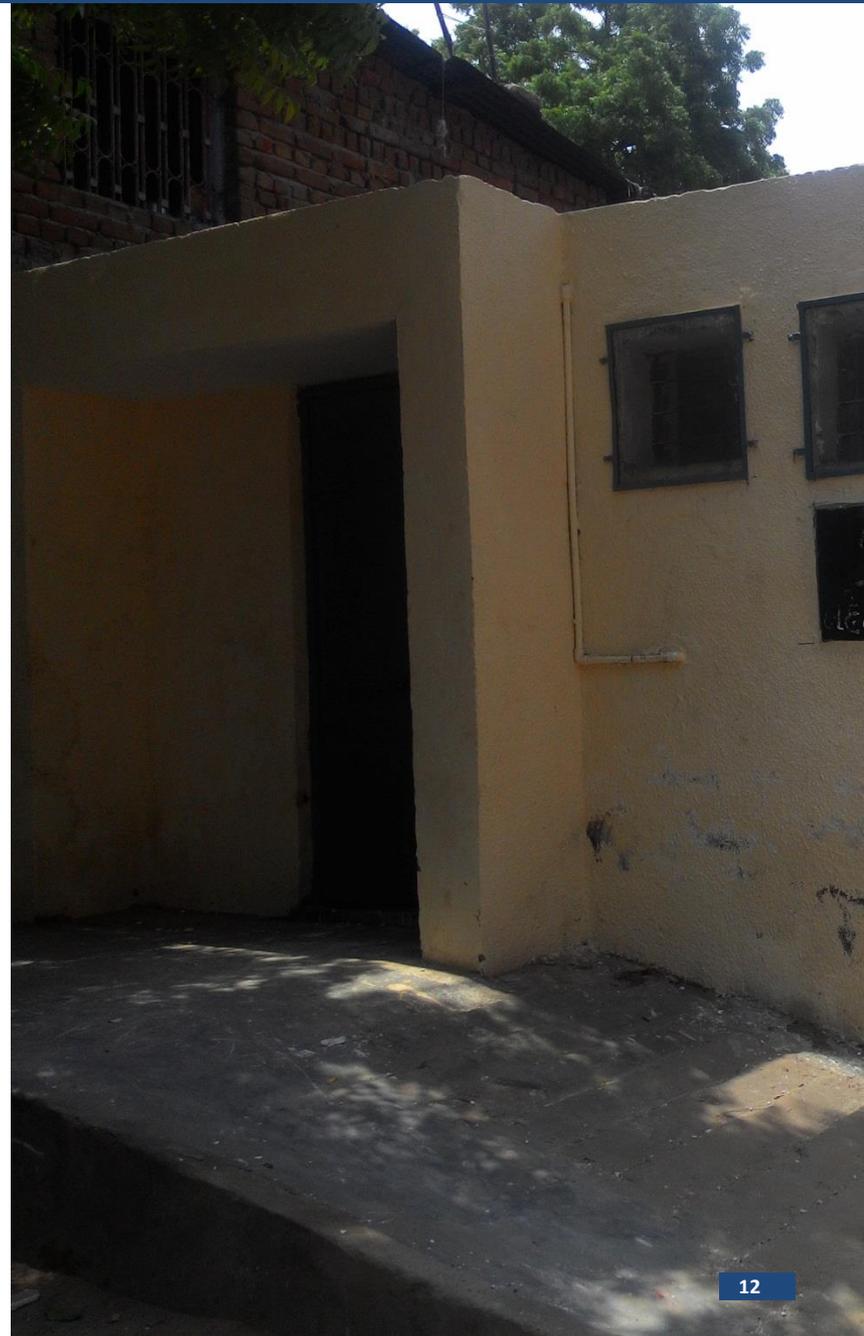


## MAINTENANCE AND SAFETY

- The flooring finish to be of anti-skid nature to avoid slipping.
- The flooring material to be a continuous surface with minimum sealed joints. Thicker joints tend to accumulate dirt.
- Preferred materials for flooring – Full body Vitrified Tiles (Grade AC-4), Porcelain Tiles, Kota Stone
- Wall Finish surface to be as smooth as possible and easily cleaned with readily available products.
- The material should be impervious to water within minimum sealed joints.
- The impervious wall finish to extend till 7 feet (2.1m) on wall.
- Preferred materials for Wall finishes- Ceramic tiles till 7 feet. Above 7 feet- Plastered wall with Oil Bound Distemper/ Acrylic Emulsion/ Cement Wash finish.
- Sharp corners to be avoided. Outside corners to be chamfered or rounded.

## CUBICLE PARTITION SYSTEM

- Wherever possible, compact grade laminate partition system to be used. These partition systems provide saving in space as well are easy to maintain and used.
- If brick walls are used as partitions, ensure the height of these are till 7feet only.
- The Door of the partitions to be raised by 100mm (4inches). This ensure air circulation within the cubicle.
- All cubicle doors to open towards outside to provide emergency support to some child who has fallen against the edge of the door.



# NORMS FOR ADEQUACY OF WATER-SANITATION FACILITIES

The following table presents norms for provision of WASH facilities based on Indian Standard (IS) codes for non-residential education buildings and UMC's field experience.

Sr	Utility	Numbers to be provided
1	Toilet cubicle for CWSN	<ul style="list-style-type: none"><li>• One unit for Boys</li><li>• One unit for Girls</li></ul>
2	Toilet seats ( Squatting pan- Indian or Western)	<ul style="list-style-type: none"><li>• One unit for every 40 Boys</li><li>• One unit for every 25 Girls</li></ul>
3	Boy's urinal	One unit for every 50 boys with 1 flushing system in each urinal
4	Drinking water tap	One Drinking water Taps for every 50 students
5	Hand wash for Mid – day meal	Minimum of three. One wash tap for every 20 children .
6	Washbasins in toilet	<ul style="list-style-type: none"><li>• One wash basins for every 60 Boys students (with soap tray)</li><li>• One wash basins for every 40 Girls students(with soap tray)</li></ul>
7	Ventilation	<ul style="list-style-type: none"><li>• One 45 cm x 60 cm in each toilet cubicles</li><li>• Ventilation size should be 20% of the floor area</li></ul>

# ESSENTIAL HARDWARE COMPONENTS FOR TOILETS

## BOY'S TOILET CUBICLES

- Squatting Pan – Indian or Western. Wall hung WCs are preferred as it reduces floor joints which are susceptible to germs. Cleaning of floor is easier by using wall hung WCs.
- Dual flushing mechanism for WCs.
- Hooks for clothes etc.
- Doors with child friendly latches and 'Cubicle occupied' sign.
- Provision of dustbin within the boys' toilet.
- Partition (Modesty Panel) between urinals.
- Drainage pipes from urinal fixture to go directly into the main drainage. Open drains from urinal to be avoided as this leads to unhygienic conditions
- Piped water supply in urinals for flushing (unless waterless urinals are used).



## GIRL'S TOILET CUBICLES

- Squatting pan (Indian or western or both) Wall hung WCs are preferred as it reduces floor joints which are susceptible to germs. Cleaning of floor is easier by using wall hung WCs.
- Dual Flush mechanism for WCs.
- Hooks for clothes/etc.
- Doors with child-friendly latches and 'Cubicle occupied' sign.
- Provision of dustbin within the Girls' toilet and each WC cubicle for Sanitary pad disposal.
- Installation of Sanitary pad dispensers within the Girls' toilet.



## FOR CHILD WITH SPECIAL NEEDS (CWSN) TOILETS

- A minimum of one toilet cubicle for girls and boys each for children with special needs (CWSN) as per standards
- Squatting Pan – Indian or Western. Wall hung WCs are preferred as it reduces floor joints which are susceptible to germs. Cleaning of floor is easier by using wall hung WCs.
- Dual flushing mechanism for WCs is preferred or regulated flushing system .
- Hooks for clothes etc.
- Doors with child friendly latches and 'Cubicle occupied' sign.
- Provision of dustbin within the toilet.
- Installation of grab bars- horizontal and vertical, for ease of use of WCs for CWSN
- Floor drop to be not more than 6mm.



## FOR OTHER WASH INFRASTRUCTURE

- The drawing shows a floor drop of 10mm, while the text mentions it as 15mm. 10mm drop is adequate. (Update)
- The door of the toilet cubicle should open outside.
- Tile dado up to 7 feet is preferred for ease of maintenance.



# ESSENTIAL HARDWARE COMPONENTS FOR OTHER WASH INFRASTRUCTURE

## HAND WASH FACILITY FOR MID-DAY MEAL

- Additional hand washing facilities near the area where mid-day meals are served
- Hand washing taps and soaps should be provided at heights accessible to children of all ages
- Piped drainage should be provided to collect used water
- Hand washing area should be paved and shaded

## DISH WASH FACILITY AFTER MID-DAY MEALS

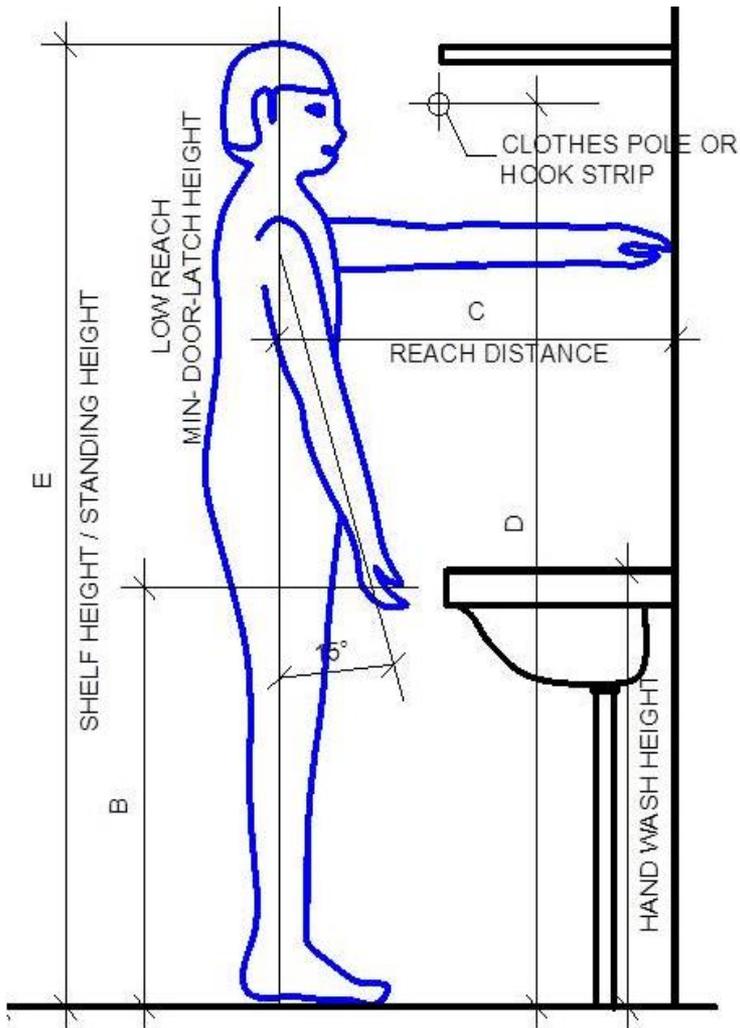
- Separate dish washing station exclusively for children to wash their plates after the meals.
- Hand washing taps and soaps should be provided at heights accessible to children of all ages
- Dust bin near the station to collect food waste
- Piped drainage should be provided to collect used water

## SAFE DRINKING WATER FACILITY

- Adequate number of taps to meet requirement of peak number of children
- Drinking water taps should be provided at heights accessible to children of all ages
- if school receives treated water, then test water being supplied to children and if needed, an appropriate treatment of water to be ensured in schools that meets BIS 10500 standards
- Adequate storage of treated drinking water to meet requirement of peak number of children so that treated water is available to all children during short break time .
- Piped drainage to collect used water which could be reused either for landscaping or for flushing toilets
- Drinking water area should be paved and preferably be shaded



# ANTHROPOMETRIC CONSIDERATIONS FOR CHILDREN (5 TO 15 YEARS)



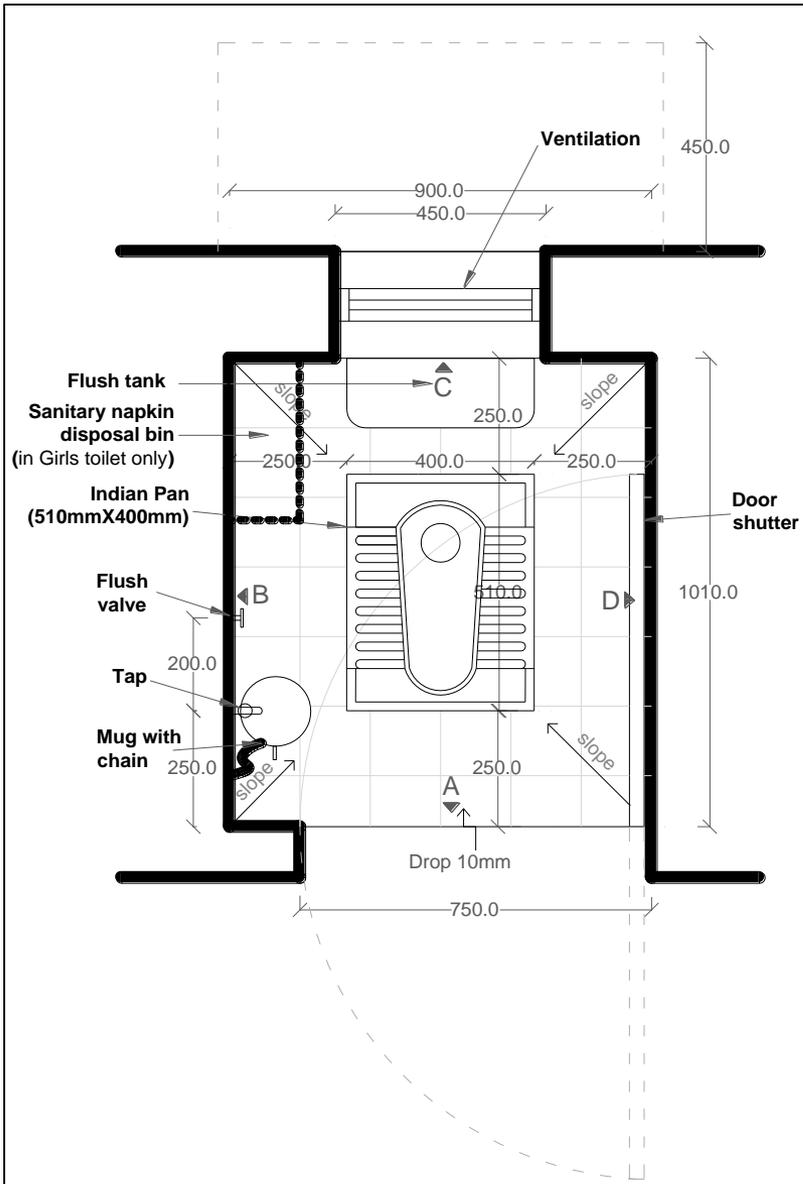
Source : architectural graphic standard

Age (years)	Door Latch Height (B)		Reach Distance (C)	
	mm	in	mm	in
15	730	28.5	685	27
12	630	24.5	620	24.5
9	555	22	550	21.5
7	510	20	495	19.5
5	465	18.5	435	17.0

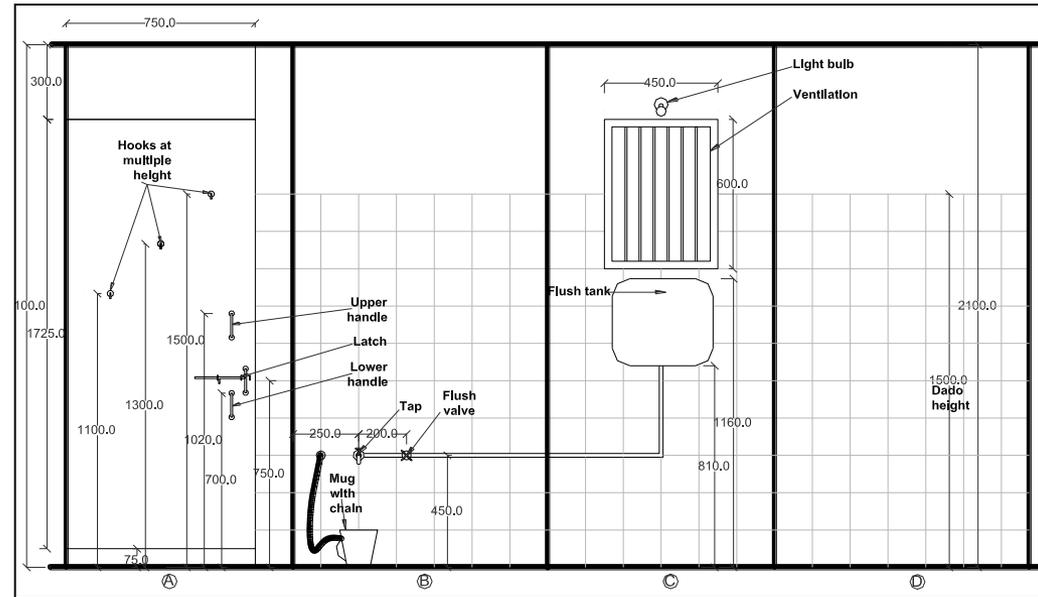
Age (years)	Hooks (D)		Shelf Height (E)		Hand wash Height (F)	
	mm	in	mm	in	mm	in
15	1575	62	1675	66	760	30
12	1385	54.5	1485	58.5	685	27
9	1220	48.0	1320	52.0	635	25.0
7	1120	44.0	1220	48.0	585	23.0
5	990	39.0	1090	43.0	485	19.0

# DESIGN GUIDELINES: TYPICAL TOILET CUBICLE

## Option -1 (Indian pan, no wash basin within cubicle)



PLAN

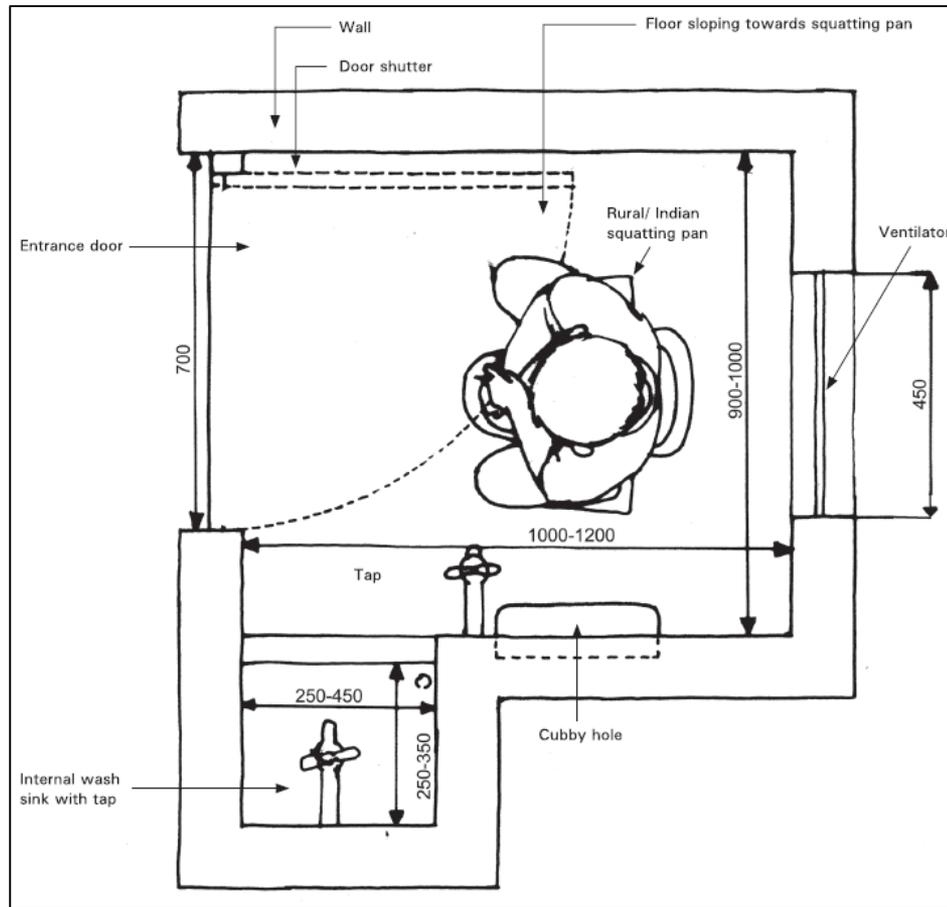


ELEVATION

- Minimum area of the toilet cubicle should not be less than 0.9 sq m
- The slope inside the cubicle should be towards the toilet seats to drain off water
- A drop of 15 mm in the flooring should be provided at the cubicle door
- In case of girls toilet cubicle- a small niche at child accessible height (571 mm from floor) needs to be placed for new sanitary napkins. Additionally, a disposal bin which is attached to one of the walls must be provided in each cubicle.
- A dado of 1500 mm height should be provided for ease of maintenance.
- The door of the toilet cubicle should inside.

# DESIGN GUIDELINES: TYPICAL TOILET CUBICLE

## Option -2 (Indian pan, with wash basin within cubicle)



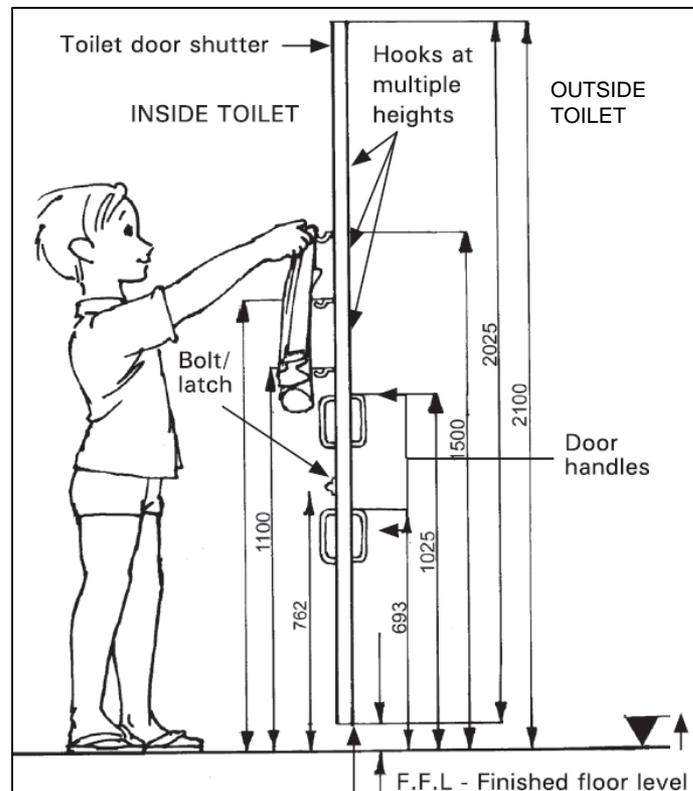
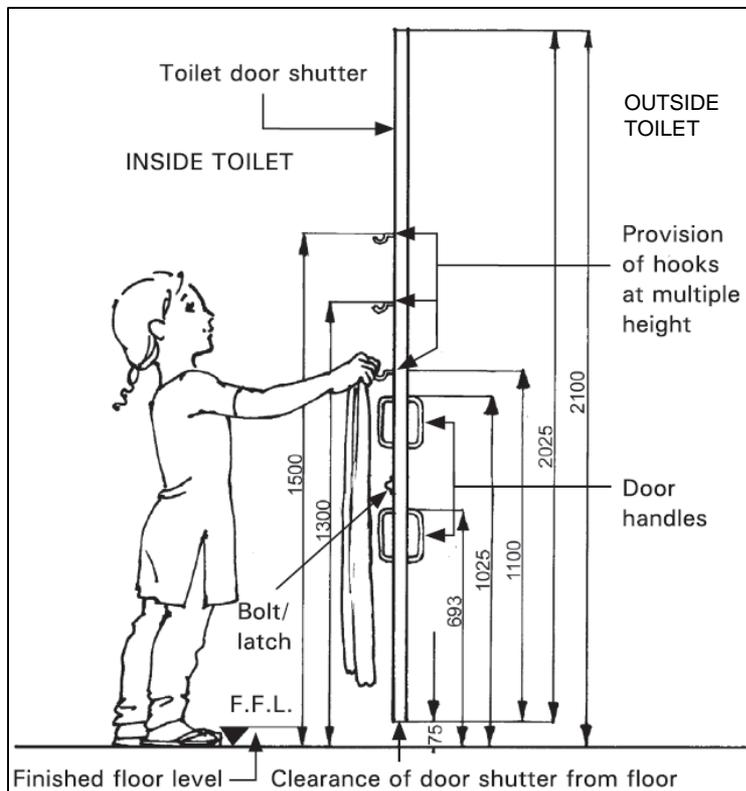
**PLAN**

- This design option includes a wash basin within the toilet cubicle.
- Internal clear size of 1000mm minimum to 1200mm maximum in depth and 900mm to 1000mm. is suggested.
- The wash basin is separate from the tap located near the toilet seat.
- The slope inside the cubicle should be towards the toilet seats to drain off water
- A drop of 15 mm in the flooring should be provided at the cubicle door
- In case of girls toilet cubicle- a small niche at child accessible height (571 mm from floor) needs to be placed for new sanitary napkins. Additionally, a disposal bin which is attached to one of the walls must be provided in each cubicle.
- A dado of 1500 mm height should be provided for ease of maintenance.

Source - An inclusive approach for school sanitation & hygiene education - technical note series – “Sarva Shiksha Abhiyan” Ministry of Rural Development, Department of Drinking Water Supply.

# DESIGN GUIDELINES: TYPICAL TOILET CUBICLE

## Design of doors

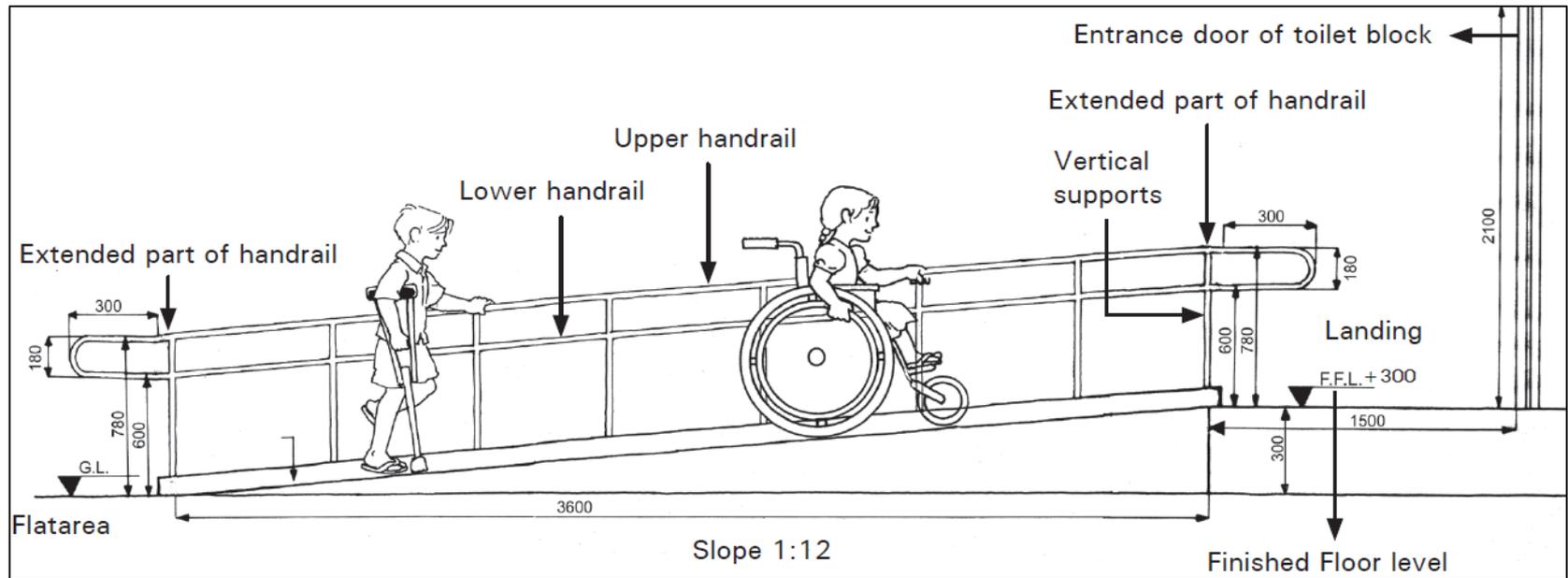


### ELEVATION

- The handles and securing bolt must be at child accessible height.
- The doors for urinals and toilets for boys and girls must have hooks at different heights (1100, 1300 and 1500 mm from the floor) to hang loose clothes.
- The door should have clearance of at least 75 mm from the floor to avoid damage due to continuous dampness or splashing of water.
- Door handles should be provided at two different heights for all age of child (693 mm and 1025 mm) or one long handle could be provided.
- The door of the toilet cubicle should open on both side. (swing door)

# DESIGN GUIDELINES: TOILET CUBICLE FOR CHILD WITH SPECIAL NEED

## Entrance ramp for CWSN



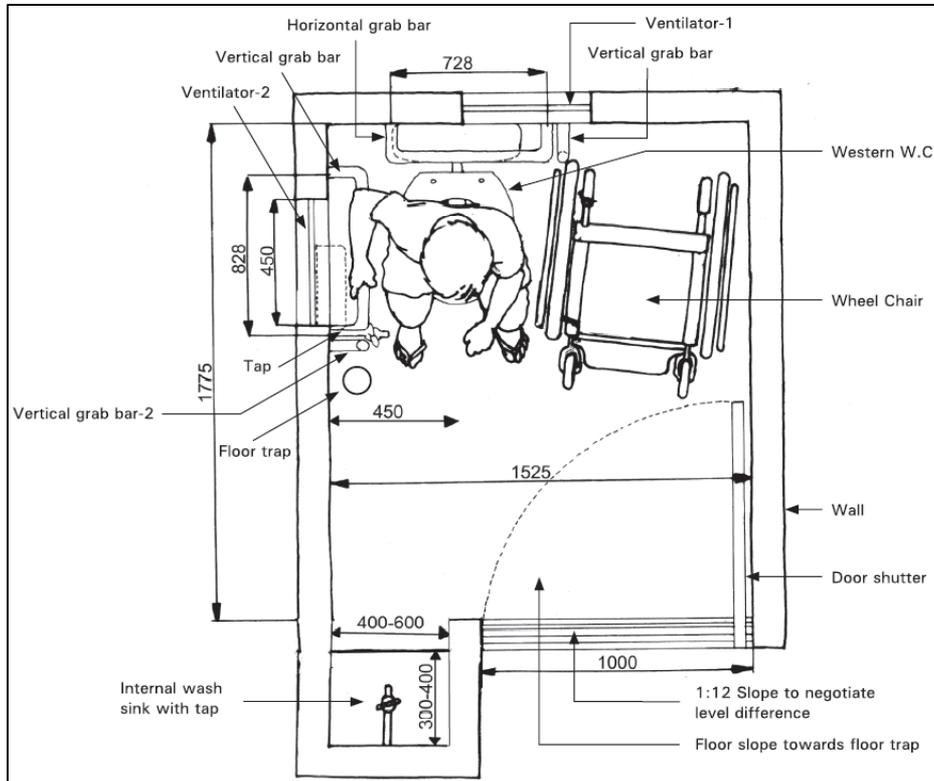
### ELEVATION

- The toilet block itself needs to be easily accessible by children with special needs from the main school block. Many a times, there are many obstacles such as level difference, unpaved areas which make navigation of wheel chair difficult. These obstacles also need to be removed.
- To ensure accessibility of toilets by all children, a ramp with hand rails and floor skirting with slope and height as shown should be provided.
- The *ideal recommended slope is 1:18*, however, if the space available is less, then slope of 1:12 can be taken. This means that for a plinth height of 300 mm from the ground, the length of the sloping ramp will be =  $300 \times 12 = 3600$  mm, as shown). The slope should not be steeper than 1:12 which will be very difficult for a child to independently propel the wheelchair
- The ramp floor must be floored with *antiskid tiles*.
- The rails must extend horizontally for 300 mm on both sides beyond the sloped area, as also the floor.

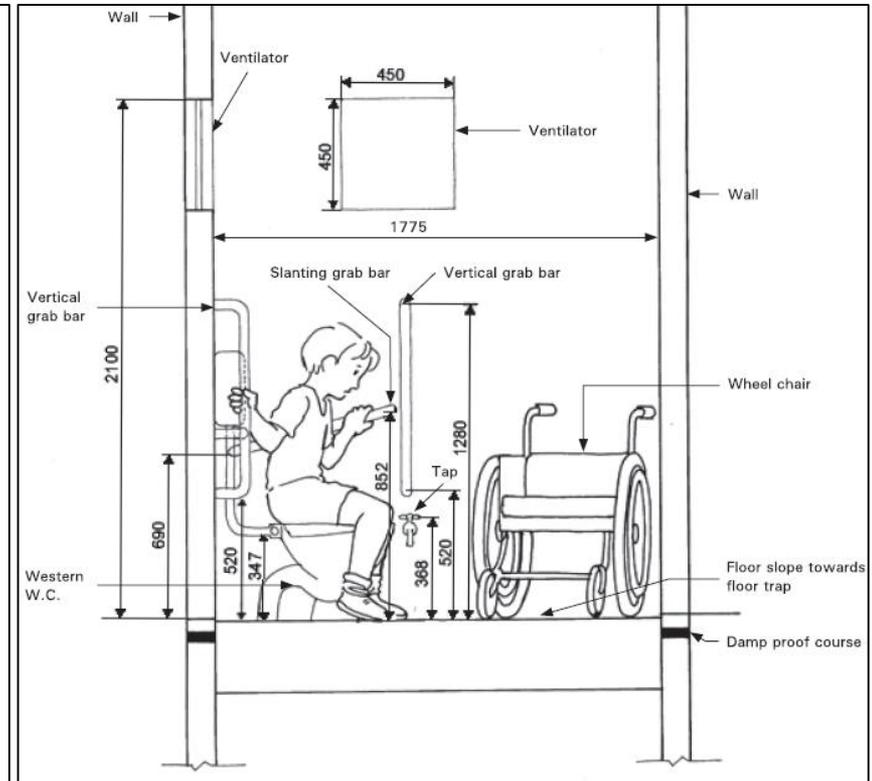


# DESIGN GUIDELINES: TOILET CUBICLE FOR CHILD WITH SPECIAL NEED

## Toilet with western WC



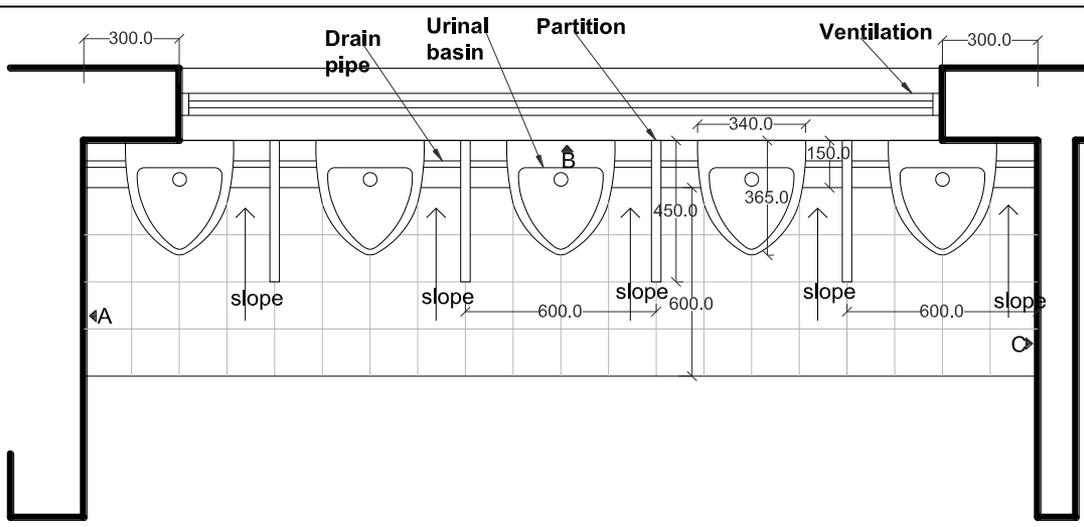
PLAN



SECTION

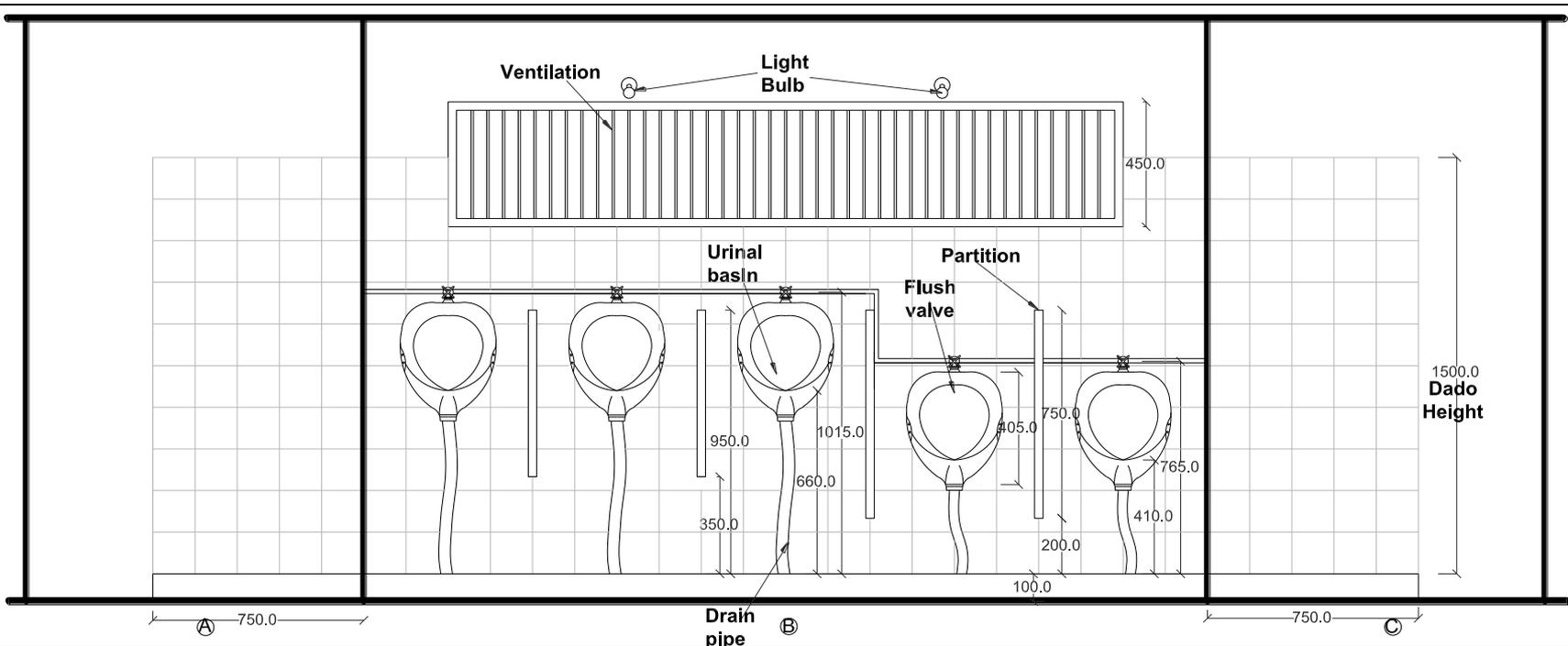
- This design is applicable for girls as well as boys CWSN toilet.
- The toilet cubicle should be minimum 1525 mm x 1775 mm.
- Ventilators with appropriate size should be located to allow the space to dry.
- Internal floor slope should be towards a floor trap to drain off excess water so that there is no accidental slippage.
- The tap must be accessible as shown.
- Location of internal horizontal and vertical grab bars is shown (with horizontal lengths 828 & 728 mm) to assist the users while using and transferring from the wheelchair to the seat and vice versa.
- The door of the toilet cubicle should open on both side. (swing door)

# DESIGN GUIDELINES: BOYS' URINAL



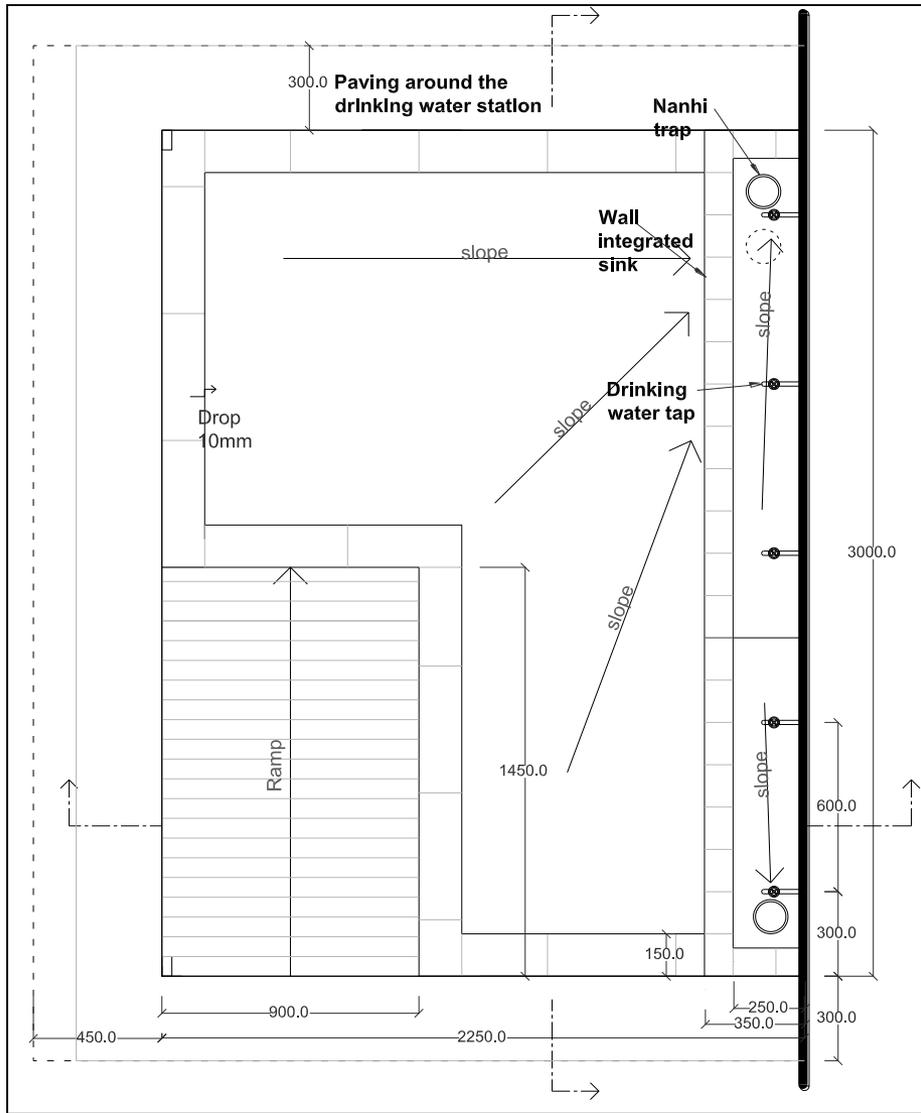
PLAN

## ELEVATION



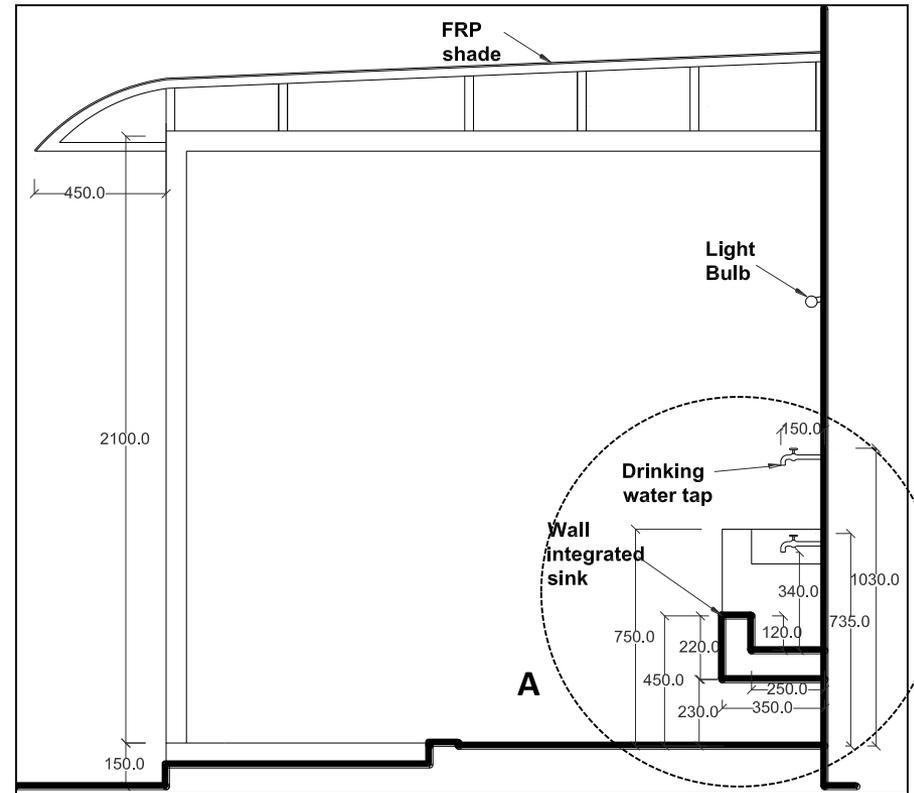
- The minimum width of a single urinal bay should be 600 mm with minimum depth 450 mm. A privacy/ modesty guard should be provided between two urinals. The modesty guard should be placed at a height of 350 mm above the floor up to a height of 950 mm.
- The urinal bay should have a minimum depth of 750 mm and 100 mm high platform.
- The depth of 450 mm shown is applicable for all urinals.
- The height of the urinal for children below 10 years of age should be 410 mm (flush valve at 765 mm) and for above 10 years should be 660 mm (flush valve at 1015 mm).
- Dado cladding should extended horizontally up to 1500 mm on walls of the urinals.
- The edges and corners of the wall should be chamfered to increase safety.

# DESIGN GUIDELINES: DRINKING WATER STATION

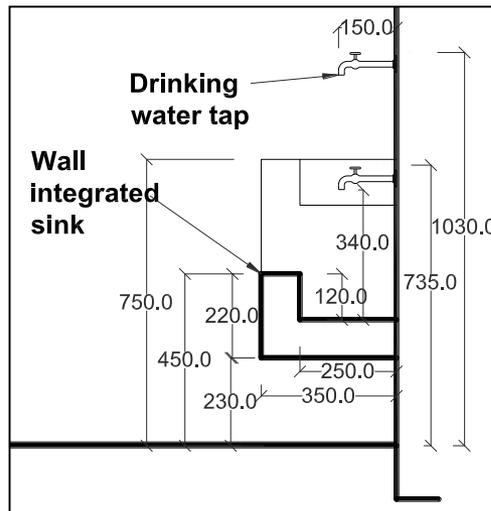


**PLAN**

**DETAIL OF A**



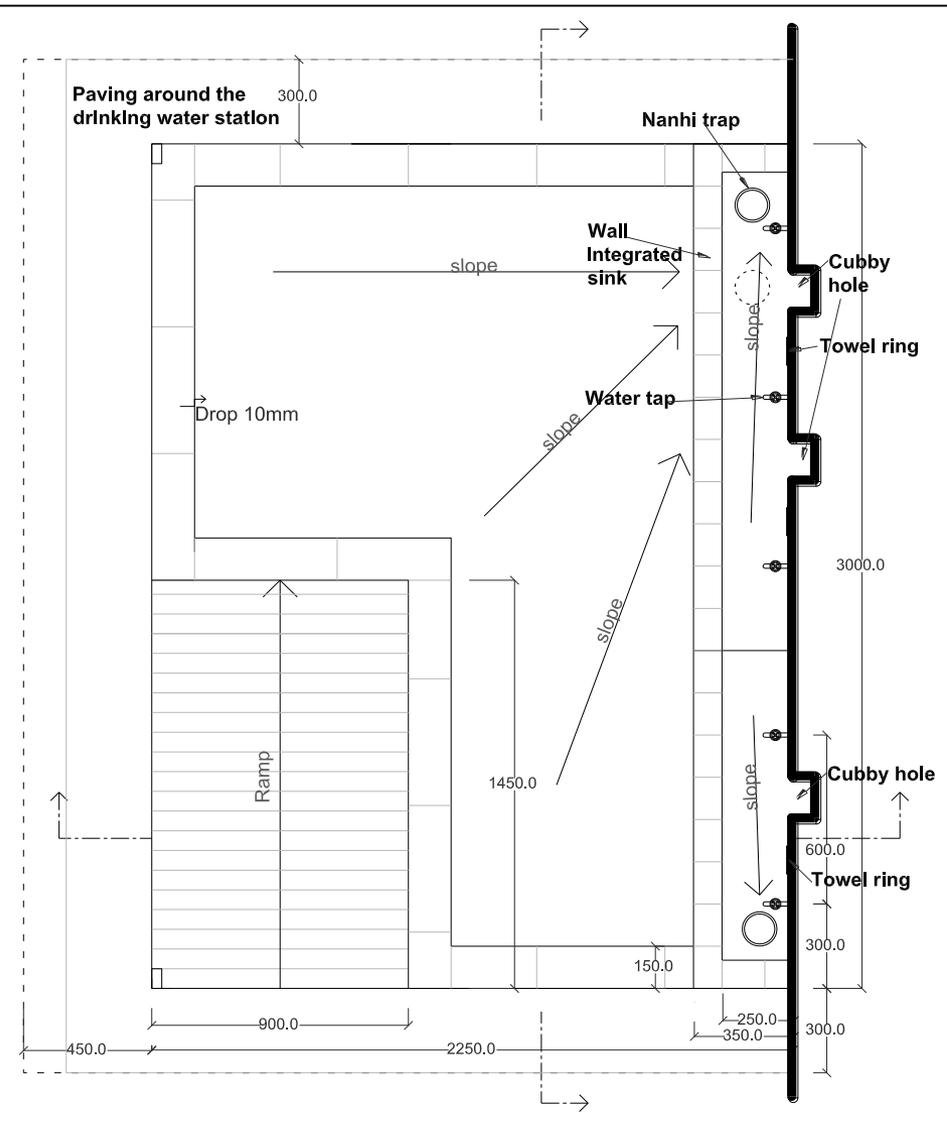
**SECTION**



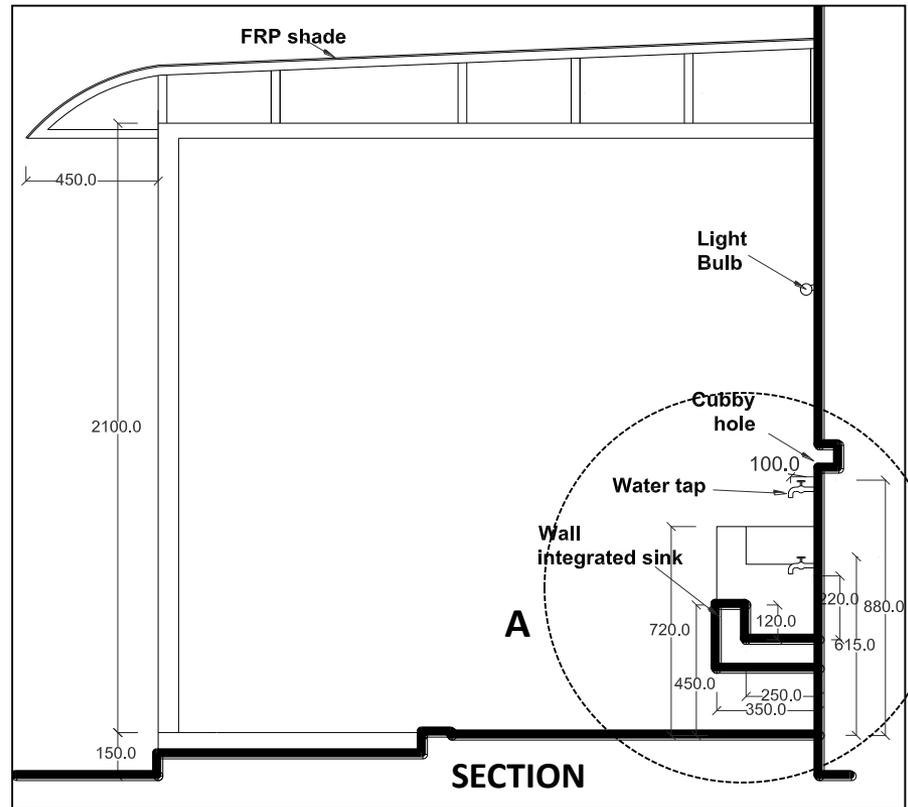
- To prevent water from overflowing, a 10 mm drop should be provided at the edge of the platform .
- There should be a slope in the basin should be provided.



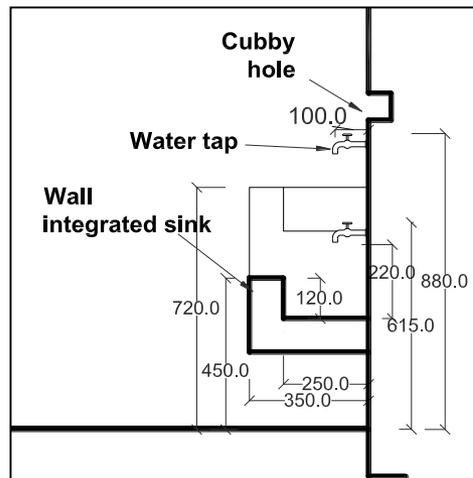
# DESIGN GUIDELINES: HANDWASH AND DISH WASHING STATION



**PLAN**



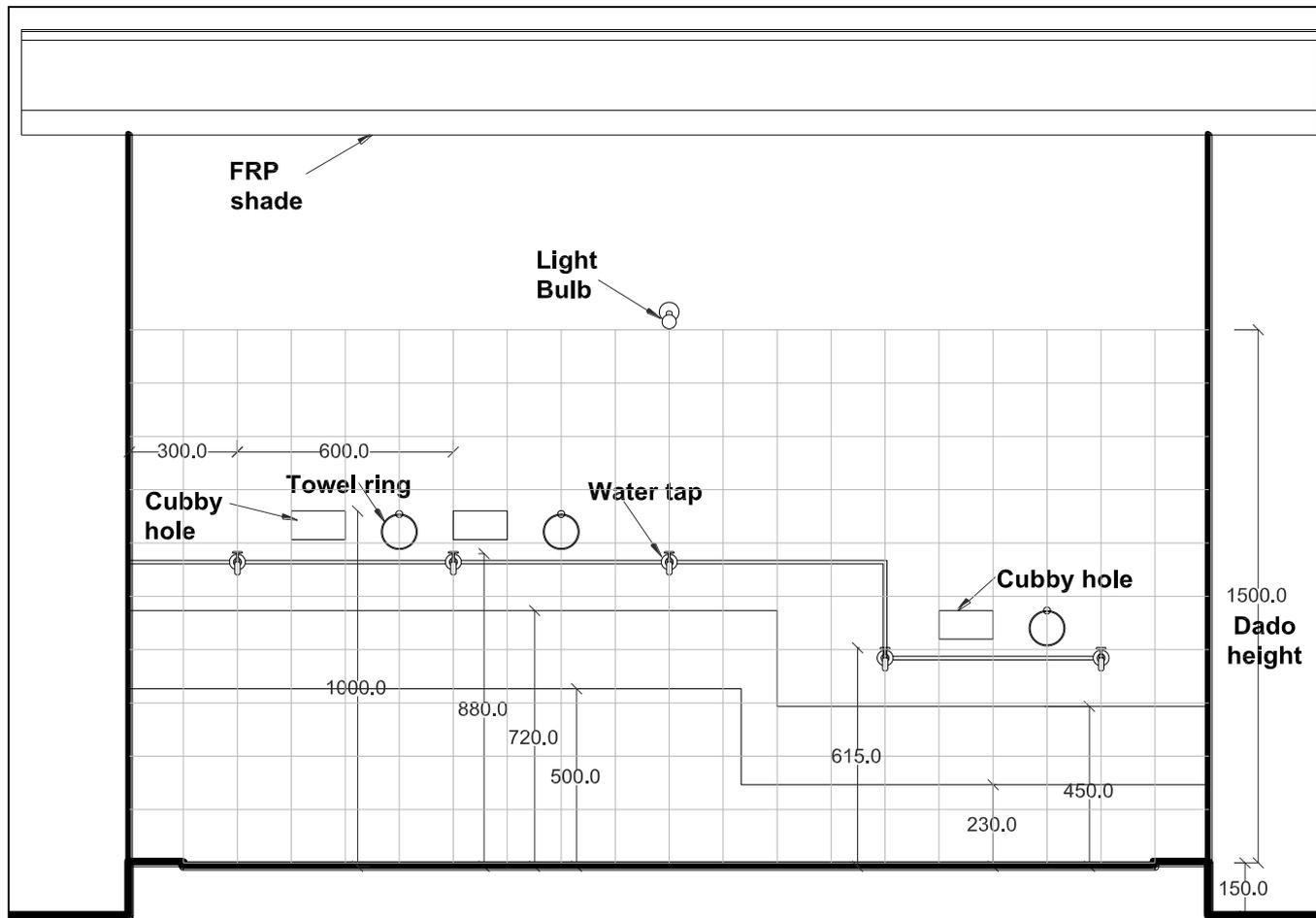
**SECTION**



**DETAIL OF A**

- To prevent water from overflowing, a 10 mm drop should be provided at the edge of the platform .
- There should be a slope in the basin should be provided.
- A ramp with non- slippery finish should be provided for children with special needs

# DESIGN GUIDELINES: HANDWASH AND DISH WASHING STATION



**ELEVATION**

- A shade with an overhang of minimum 300 mm should be provided above the hand wash station.
- Height of the taps should be at 880 mm & 615 mm from the floor for ease of access by different age groups. There should be a minimum distance of 600 mm between the taps.
- A dado should be up to height of 1500 mm from the floor level.
- Height of the basins should be 450 mm for children below 10 years age and 720 mm for children above 10 years.
- Height of the platform should be 150 mm above the ground level and paving should done around the platform.
- Edges and corners of the wall should chamfered to increase safety.



Let's be sensitive.  
Make child-friendly  
facilities for students.

13 year old Manju avoids  
drinking water to evade  
using a dirty toilet.



### **Contact Information**

Urban Management Centre

A-202 GCP, Opp Memnagar Fire Station

Near Vijay Cross Roads, Navrangpura, Ahmedabad

Telefax: 91 79 26400307/06

URL: [www.umcasia.org](http://www.umcasia.org)