

between 19 mm and 25 mm in diameter; ‘D-Lever’ handles are preferred (*see* Fig. 66). A vertical bar for sliding doors should be 30 mm to 50 mm in diameter. The clearance between the bar and the wall should be 45 mm to 65 mm. The backset of a latch/lock should be a minimum of 30 mm. Other door furniture should be 30 mm from the door edge. Suitable clearance should be provided between adjacent fixtures and fittings to prevent accidental operation.

Operating force on control buttons and push plates should be 2.5 N to 5.0 N. Control for drinking water

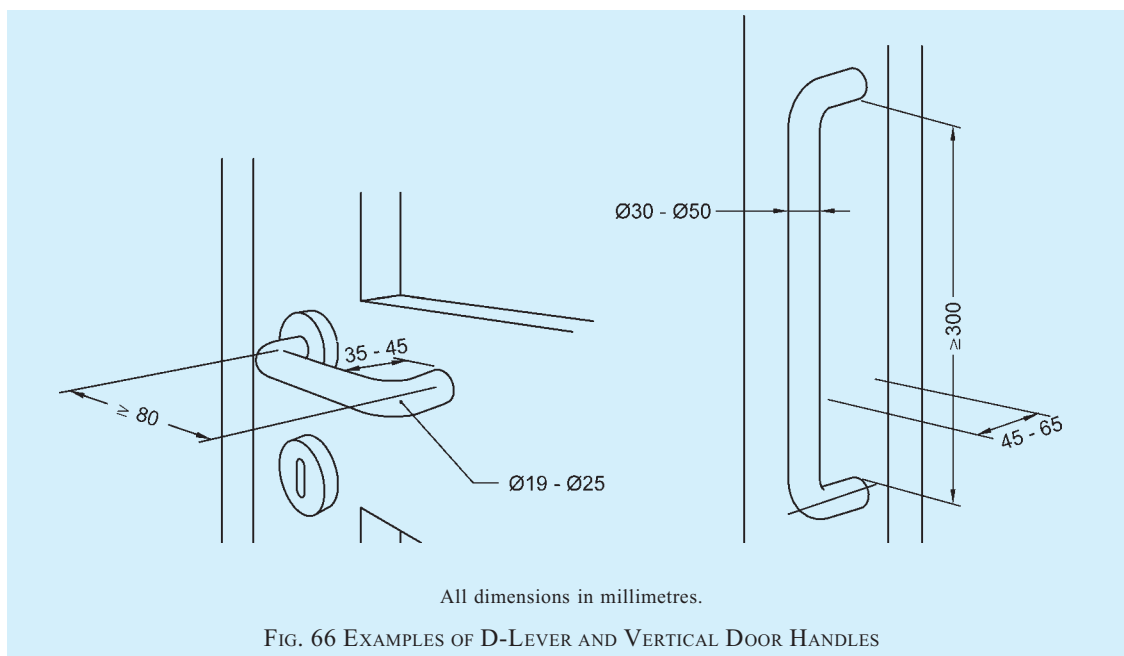
fountains shall be operable with one hand with an operative force of not more than 20 N.

B-7.5 Identification

Buttons and devices should be identified by visual contrast. Information should be in raised tactile and Braille signage. All important controls should have an integral Braille indication.

B-7.6 Usability

Control devices for different functions should be



different. Control devices for similar functions should have a similar design and activation mechanism and be the same for identical functions throughout the facility.

B-7.7 Telephones

B-7.7.1 Telephones shall be on a clear accessible route with approach from the front or the side (*see* Fig. 67). All information should be provided in at least two of visual, oral and tactile forms. The telephone keypad shall have a tactile point on the number five (*see also* B-7.9).

B-7.7.2 Public Telephones

Public telephones shall be located beside the access route and shall be easily detected by people with vision impairments.

Where more than one public telephones are provided, at least one phone shall be accessible.

A clear knee space of minimum 700 mm in height and minimum 600 mm in depth and 900 mm in width shall be provided underneath to accommodate wheelchair user's knee (*see* Fig. 68).

Counter tops, where provided, shall be between 750 mm and 800 mm from the floor. The depth of the counter top shall be not less than 480 mm.

Side protection shall be considered according to B-2.6.2.

The height of all operable parts of the telephone shall be between 800 mm and 1 100 mm. The minimum length of the telephone cord shall be 900 mm.

The international symbol of accessibility shall be displayed to identify the location of such telephones.

If a public telephone is provided in an enclosed booth, the opening of the booth shall have a clear width of at least 900 mm. The enclosed space shall have clear unobstructed dimensions of at least 900 mm × 1 200 mm, which should not be restricted by fixed seats.

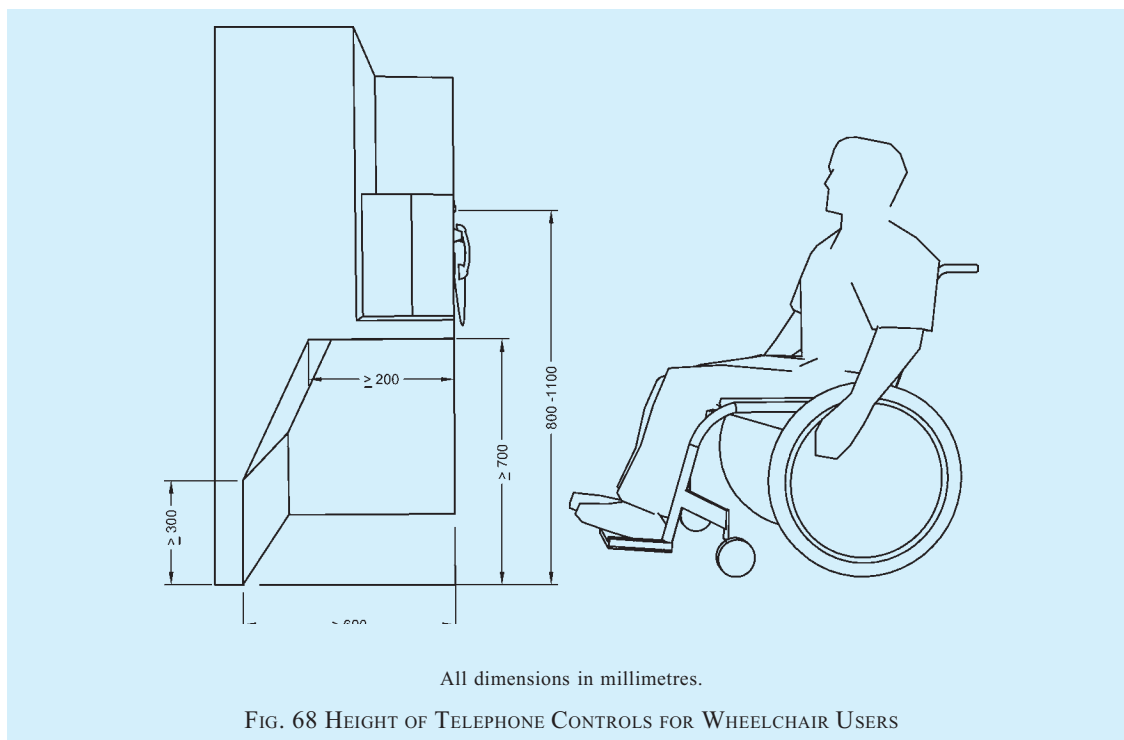
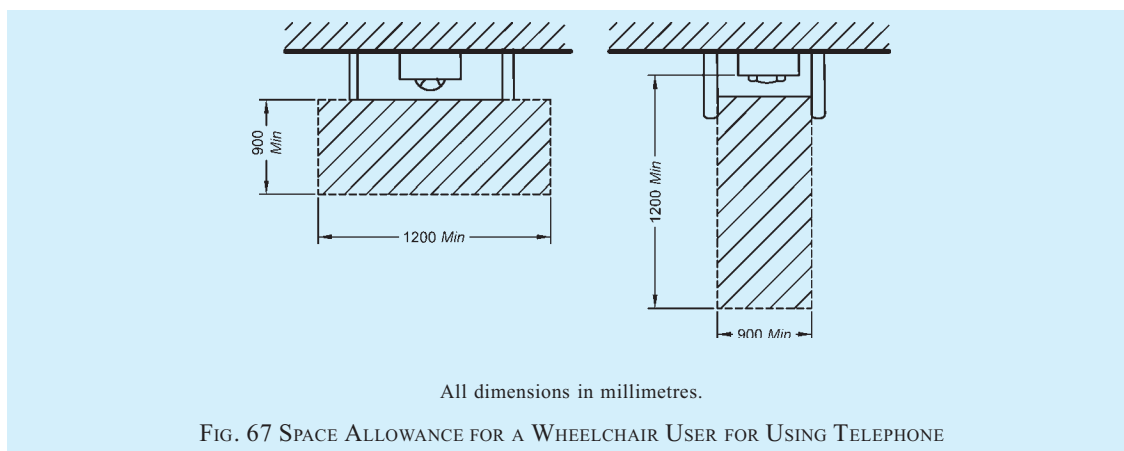
B-7.8 Mailbox/Dropbox

The mail/drop box slot should be located at the height of maximum 1 200 mm. It should have a clear floor space of 900 mm × 1 200 mm.

B-7.9 Vending Machine, Card Access, Dispensing Machines and Automatic Teller Machines (ATMs), etc

Machines for dispensing money, tickets or small goods should be accessible and should be located on an accessible level. The approach to dispensers should be clear and unobstructed, at least 900 mm wide. A knee space of minimum 700 mm in height and minimum 600 mm in depth and 900 mm in width should be provided to ease access for wheelchair users (*see* Fig. 69). The clear area immediately in front of the machine should be at least 1 500 mm × 1 500 mm, to allow a wheelchair user to approach the controls sideways, and to turn around after use and to provide some privacy.

Touch screen ticket dispensers at train/bus stations, etc, should not be the only type of ticket dispenser, as they are inaccessible to people with impaired vision. A numeric keypad should also be provided to make it



accessible for visually impaired users.

Glare from sun, artificial lighting and street lighting on the screen should be avoided.

The operation of the machine should be easy to understand.

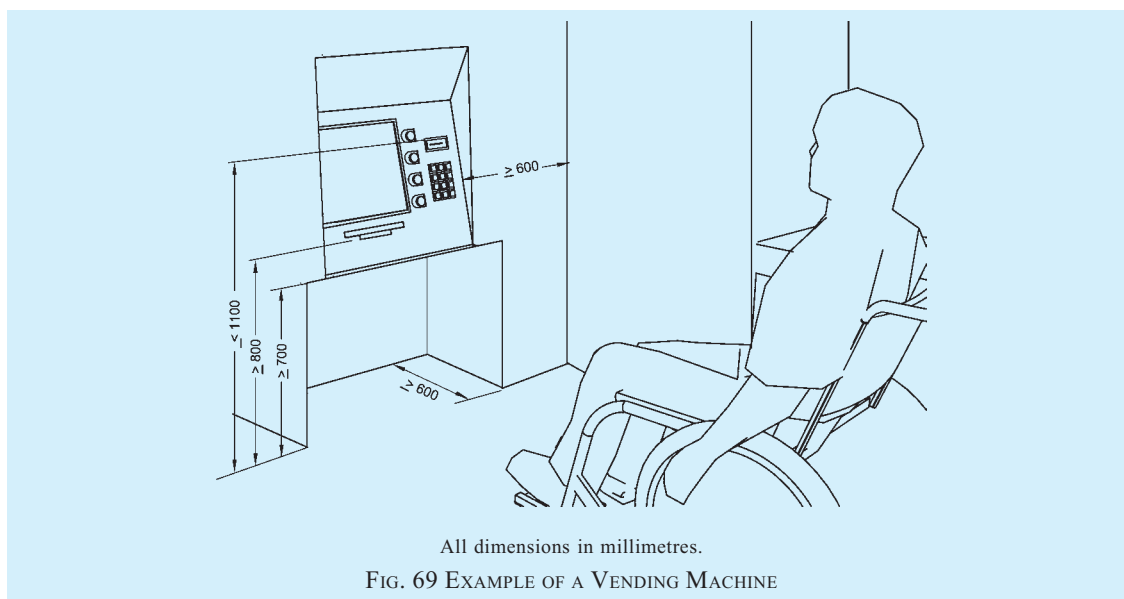
Where card access or coin slot is provided, they shall,

- have a slot located at a height of between 800 mm and 1 000 mm above the floor, preferably between 800 mm and 900 mm,
 - with its edge bevelled, and
 - colour-contrasted with the surrounding surface;

- include tactile graphic symbols on the surrounding surface that,
 - represent the card, and
 - identify the orientation of the card/coin insertion; and
- have both audible (beep) and visual (light) signals to indicate that access has been granted.

Where a keypad is provided, it shall,

- be located at a height between 800 mm and 1 000 mm from the floor;
- be colour-contrasted with the background;
- have characters and symbols on key surfaces



- that are colour-contrasted with the key surfaces;
- d) where numeric,
 - 1) the keys shall be arranged in a 12-key ascending or descending telephone keypad layout,
 - 2) the number five key shall be tactilely distinct from the other keys; the raised dot on number five shall be 0.7 ± 0.1 mm high and shall have a base 1.5 mm in diameter, and
 - 3) function key surfaces shall have tactile symbols as follows: enter or proceed key: raised circle [o]; clear or correct key: raised left arrow []; cancel key: raised letter × [x]; add value key: raised plus [+] sign; decrease value key: raised minus [-] sign; and
 - e) have both audible (beep) and visual (light) signals to indicate that access has been granted; and
 - f) have the keys readable from both a standing and a seated position.

NOTE — For ATMs and similar facilities, other requirements as laid down by the concerned authorities shall be followed.

B-7.10 Security Access Systems

Security access systems shall be designed so as to meet the needs of everyone. This includes the requirements for manoeuvring space and for controls which can be reached comfortably. See B-7.9 for requirements relating to card access and keypads. Security access systems should be usable by everyone. Biometric systems (for example retinal or palm scanners) cannot accommodate all users. To negotiate the security access systems placed at building entrances, such as, airports, railway stations, metro stations, and shopping malls,

relevant rules and regulations laid down by the concerned authorities shall be followed.

NOTE — The requirements relating to card access and keypads shall be similar to those for ATMs as laid down by the concerned authorities.

B-7.11 Drinking Water Facility

The drinking water facility (fountains, coolers, taps, etc) shall comply with the following:

- a) Wall/Post-mounted cantilevered units shall have a clear floor space of at least 900 mm × 1 200 mm as shown in Fig. 70.
- b) The front edge of the unit shall extend 430-480 mm from the wall. It shall have a clear knee space between the bottom of the apron/equipment and floor or ground of at least 900 mm wide, 200 mm deep extending from the front edge of the equipment to back towards the wall, and 700 mm high. It shall have a toe space not less than 900 mm wide, 300 mm high, extending from the back wall to a maximum of 150 mm (see Fig. 70).
- c) Freestanding or built-in-drinking water units not having a clear space under them shall have a clear floor space of at least 1 200 mm wide × 900 mm in front of the unit as shown in Fig. 71.
- d) Spout heights should be between 800-900 mm, measured from the floor to the spout outlet. The maximum distance of the spout from the front edge of the drinking water facility shall be 125 mm. There shall be water glass provision; a minimum 100 mm space below the spout outlet shall be provided to allow for the insertion of a cup or glass.
- e) Wall-mounted drinking water provision in an alcove is preferred, because it does not create

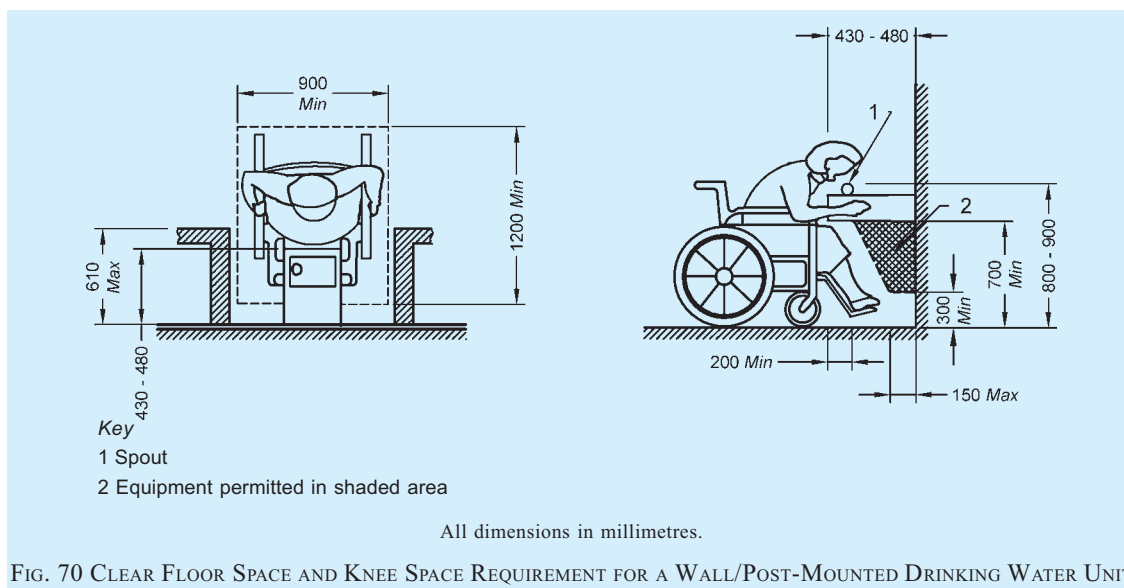


FIG. 70 CLEAR FLOOR SPACE AND KNEE SPACE REQUIREMENT FOR A WALL/POST-MOUNTED DRINKING WATER UNIT

a hazard for persons with visual impairments. The provision of two drinking facilities at different heights is very convenient for standing adults, people in wheelchairs and children. Where only one is provided, it shall be at a height of 700 mm above floor level

- 4) Controls shall be centrally positioned at the front of the unit or, if at the side, on both sides, not more than 180 mm from the front and shall comply with B-7. Control shall be easily operable with one hand with an operative force as given in B-7.

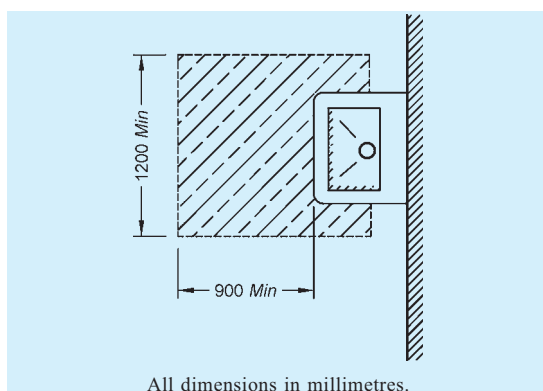


FIG. 71 CLEAR FLOOR SPACE FOR FREESTANDING OR BUILT-IN DRINKING WATER UNIT NOT HAVING CLEAR SPACE UNDER THE UNIT

B-7.12 Dust Bins

Dust bins should be fully accessible and easy to use for everybody.

B-8 SEATING SPACES

B-8.1 General

Seating facilities should be provided in public

buildings to provide people with a place to wait and to rest. The location of seats (including reserved areas for wheelchairs) should not disturb the general circulation.

Seating facilities shall have a clear and level floor space of not less than 900 mm × 1 200 mm.

Seats should be designed with armrests to facilitate sitting down and standing up. The seats should also have back rests (*see* Fig. 72).

B-8.2 Seating in Waiting Areas

A range of different types of seating should be provided complying with the following (*see* Fig. 72):

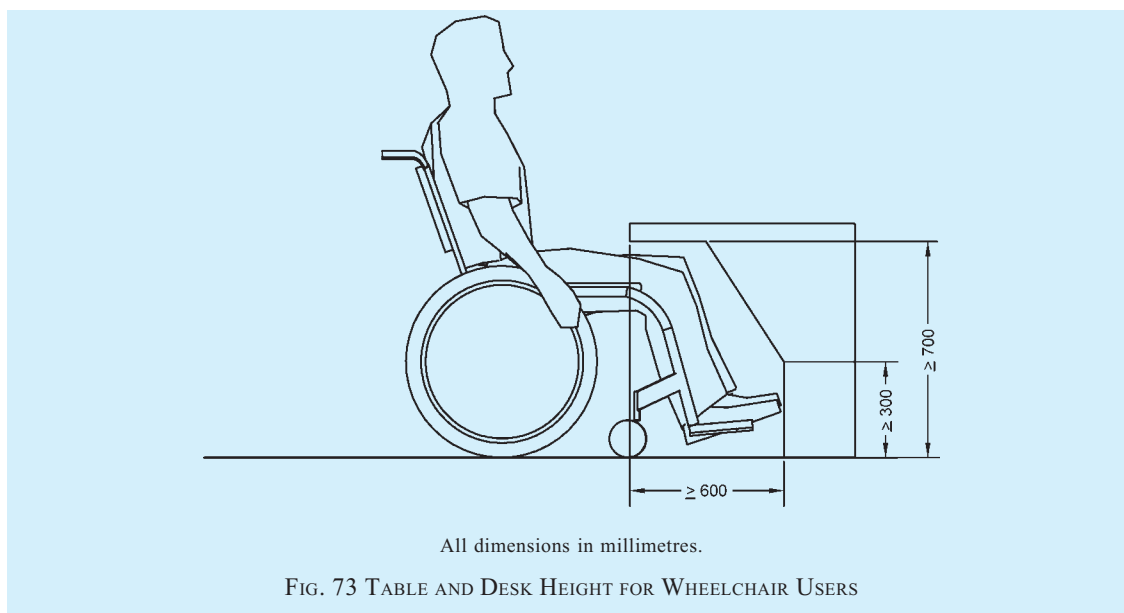
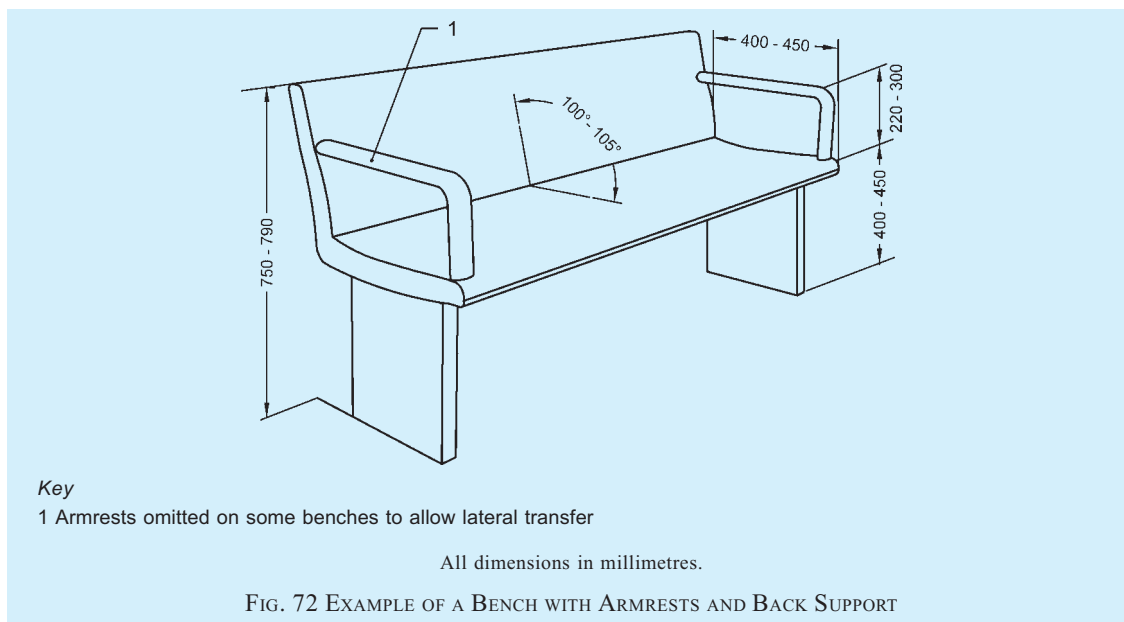
- a) Seat height 400 mm to 450 mm,
- b) Back support height 750 mm to 790 mm,
- c) Seat depth 400 mm to 450 mm,
- d) Angle of seat to backrest 100° to 105°,
- e) Armrest height 220 mm to 300 mm above seat,
- f) Armrest set back from front of seat ≤ 75 mm, and
- g) A minimum 150 mm set back under the seat for feet when standing up.

B-8.3 Seating at Desks, Tables, etc

To allow a frontal approach with a wheelchair to a table, desk, counter, telephone, etc, an unobstructed space shall be provided with a minimum free height of 700 mm, minimum free depth of 600 mm (*see* Note) and minimum width of 900 mm to accommodate knees underneath. For footrests, a minimum height of 300 mm is required (*see* Fig. 73).

NOTE — This may overlap the clear floor space by a maximum of 480 mm.

If tables with fixed seats are used, there shall be a place for at least one person in a wheelchair at the table.



B-9 TOILET ROOMS AND SANITARY ROOMS

B-9.1 General

Sanitary facilities shall be designed to accommodate a variety of users. Accessible toilets that can be used by both sexes (unisex accessible toilets) allow the greatest flexibility for people who require assistance hence is the preferred option. Wheelchair accessible unisex toilets should always be provided in addition to wheelchair accessible separate sex toilets. Similarly, a provision of an enlarged cubicle for ambulant disabled people in a separate sex toilet room can also benefit parents with children and people who need an enlarged space (for example those with luggage).

The accessible toilet room shall be located as close as possible to the entrance/reception/waiting area of the building and should be easy to find. It should not be so located that it compromises the privacy of users.

If only one toilet is decided to be provided considering the estimated requirement as per this Code, it shall be Type A unisex accessible toilet (*see B-9.2* for types of toilets). Where, more than one accessible toilet is provided, different options exist.

Where sanitary facilities are provided, the following shall also apply:

- At least one unisex wheelchair user accessible toilet room of Type A, with central placement

- of WC, shall be provided, which shall always contain a washbasin.
- b) One accessible toilet (Type A or Type B) in single sex toilet block (male and female section of toilet block) shall be provided depending on the footfall and space.
- c) When more than one accessible corner toilet of Type B is planned, a choice of layouts suitable for left hand and right hand transfer shall be provided. In case such toilets are located in similar position on each floor of a multi-storey building, it should allow for right and left hand transfer on alternate floors. In any case, a unisex accessible toilet of Type A shall be provided on the ground floor so as to be able to meet the need for both left and right side transfers.
- d) In all separate sex toilet/sanitary rooms there shall be provision for one cubicle suitable for use by ambulant disabled.
- e) Where urinals are provided, there shall be urinals for wheelchair users and ambulant disabled people.
- f) Where there is requirement for only one toilet or sanitary room in a building, a wheelchair accessible unisex toilet of Type A shall be provided but of a greater width to accommodate a standing height washbasin and a urinal.
- g) The provision of the accessible toilets shall be such that any wheelchair user/ambulant disabled person doesn't have to travel more than 30 m on the same floor.
- h) The design of toilet facilities shall incorporate ease of use for all people and location of fittings should follow a logical sequence.
- j) Care shall be taken in placing mirrors and lights to avoid confusion and dazzling for visually impaired users.
- k) Soap dispensers and hand towels or driers shall be placed in a convenient and logical position so that they are easy to locate, identify and use.
- m) Visual contrast and lighting shall be in accordance with **B-9.16**.
- n) An emergency assistance alarm according to **B-9.12**, including a reset control, should be provided in all accessible toilets and sanitary rooms.
- p) If facilities are provided such as buttons or taps which operate by use of sensors, accessible signage shall be provided to explain the same.
- q) Signage at accessible toilet entrance shall be as per **B-9.18**.

- r) Tactile signs should be used beside rather than on doors to indicate 'Ladies' or 'Gents';
- s) For the benefit of the persons with vision impairments, all general toilets shall have marked on plates with raised alphabets and braille put on the wall next to the door latch, preferably on the left side. An additional signage shall also be provided on the door at 1 500 mm height. *See also B-24* for other requirements of signage.
- t) Many persons with visual impairments find it convenient to use the toilets where internal dimensions, accessories and fixtures placement are standardized. A tactile layout of the toilet should be provided on the wall, near the latch side at 900 mm height.
- u) A distinct audio sound (beeper/clapper) may be installed above the entrance door for the identification of the toilets by persons with visual impairments.

B-9.2 Wheelchair User Accessible Toilet Rooms

B-9.2.1 This Part gives the characteristics and requirements for the two types of wheelchair user accessible toilet rooms, namely, Type A and Type B.

The clear manoeuvring space of the toilet room shall allow frontal, oblique and lateral transfer. Type A toilet with a central placement of WC allows right and left lateral transfer, and may be more suitable when assistance is needed. Types B only allow one side transfer.

The clear manoeuvring space at floor level in front of the water-closet and the washbasin in case of Type A toilets shall be 1 800 mm × 1 800 mm, except for Type B where it shall be 1 500 mm × 1 500 mm by using the 300 mm space under the washbasin as part of the total manoeuvring space.

The minimum free clearance beside the water-closet shall be 900 mm, whereas 1 200 mm is preferred for lateral transfer and assistance.

NOTE — Minimum clearance of 900 mm accommodates only 65 percent of the wheelchair users, clearance of 1 200 mm accommodates 90 percent of all wheelchair users especially also those who use powered wheelchairs.

The minimum dimensions for a Type A accessible toilet room are 2 200 mm width and 2 300 mm depth, and the minimum dimensions for a Type B accessible toilet room are 1 700 mm width and 2 200 mm depth.

NOTE — In case of existing buildings, as part of exceptional considerations, the measures given above cannot be achieved due to technical reasons, the manoeuvring space at floor level may be reduced, but it should be recognized that such a reduction limits the number of people who can use these toilet rooms.

B-9.2.2 Type A Toilet Room with Lateral Transfer from Both Sides

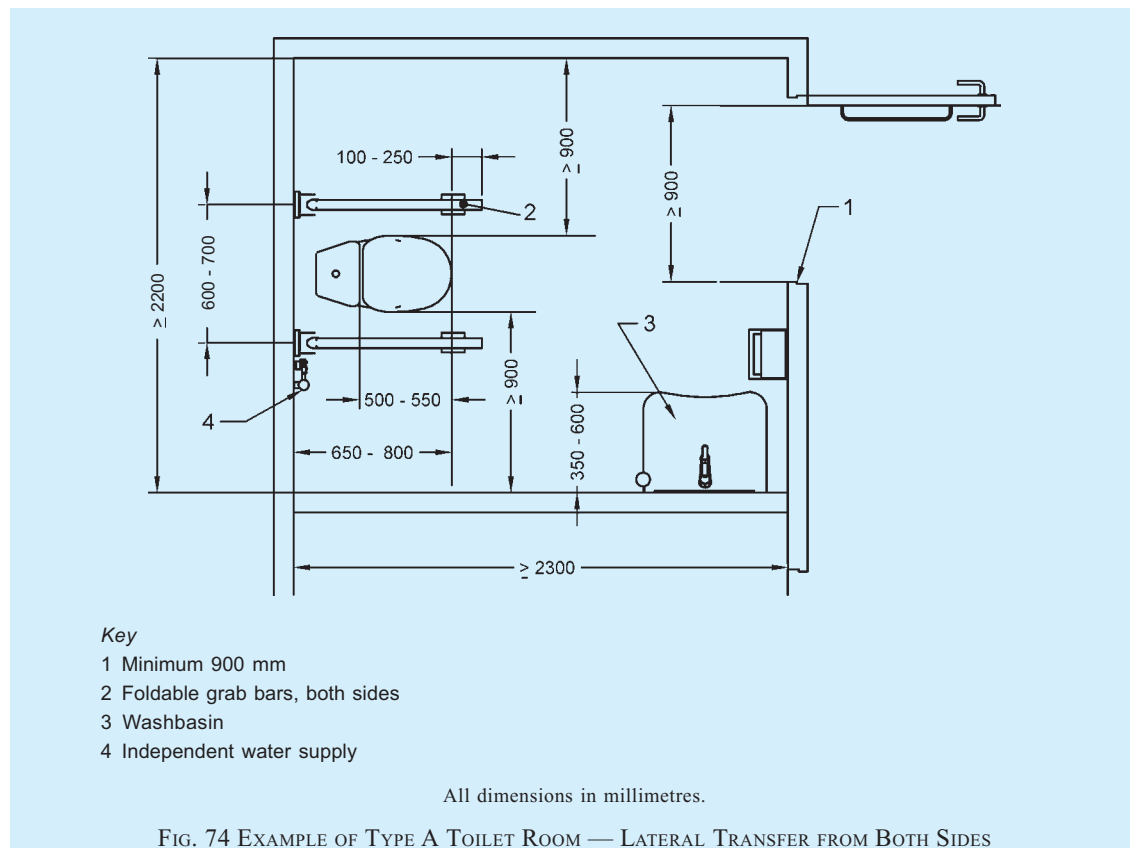
B-9.2.2.1 Type A accessible toilet room has the following characteristics (see Fig. 74 and Fig. 75):

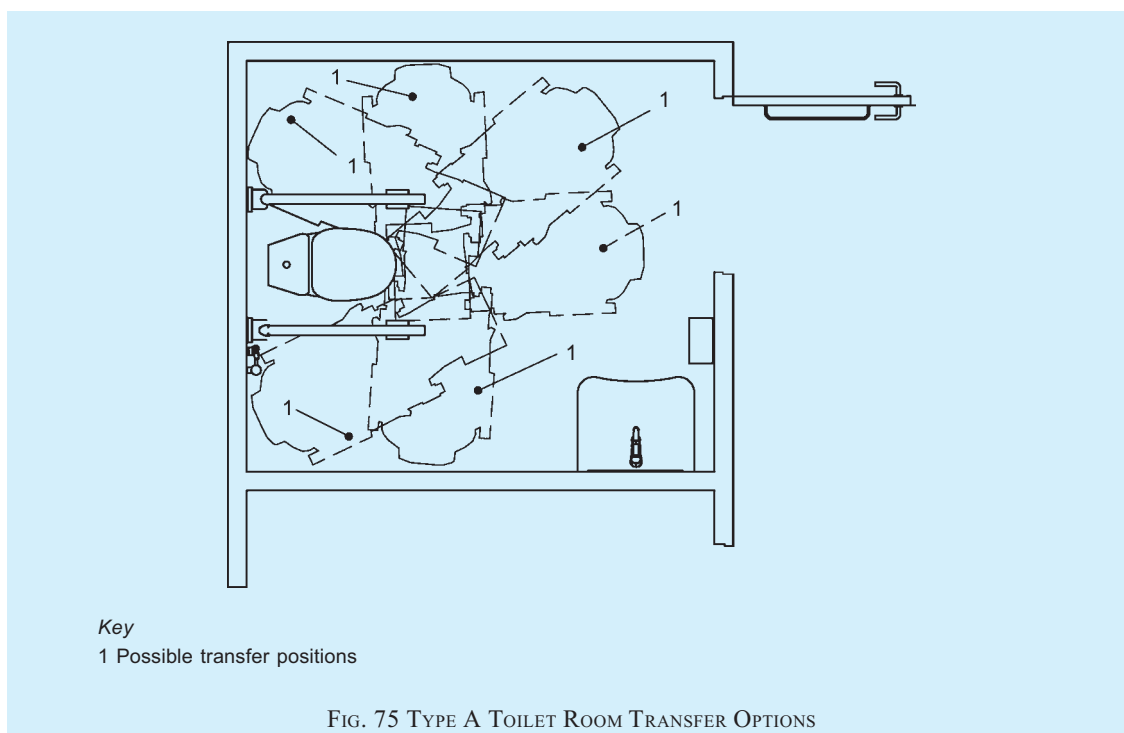
- a) Lateral transfer from both sides,
- b) Manoeuvring space uninterrupted by washbasin and pan,
- c) Independent water supply beside water-closet,
- d) Horizontal grab rails at both sides, and
- e) Toilet paper dispensers on both folding grab rails.

B-9.2.2.2 Type A accessible toilet room shall meet the following requirements (see Fig. 74):

- a) It shall have minimum internal dimensions 2 200 mm × 2 300 mm.
- b) The layout of the fixtures in the toilet shall be such that there is a clear manoeuvring space that provides a wheelchair turning radius of 1 800 mm in front of the water-closet and washbasin in the accessible toilet unit.
- c) It shall have all fixtures and utilities arranged in a manner to provide a clear space of 900 mm × 1 350 mm for wheelchair users to access them.

- d) It shall have clear space of not less than 900 mm wide next to the water-closet.
- e) It shall be equipped with a door complying with **B-9.4**.
- f) It shall have a water-closet complying with **B-9.5**, grab bars complying with **B-9.6** and washbasin complying with **B-9.7**.
- g) It shall have essential washroom accessories complying with **B-9.8**.
- h) It shall have an alarm to seek emergency help, complying with **B-9.12**.
- j) It shall have the toilet roll dispenser and hand water faucet mounted below the grab bars and at not more than 300 mm from the front edge of the seat and at a height between 50 mm and 200 mm from the top of the water-closet seat.
- k) Cloth hooks should be set at different heights, 900 mm to 1 100 mm, and additionally at least one hook at 1 400 mm; and projecting not more than 40 mm from the wall.
- m) Where possible, be equipped with a shelf of dimensions 400 mm × 200 mm fixed at a height of between 900 mm and 1 000 mm from the floor.





B-9.2.3 Type B Toilet Room with Lateral Transfer from One Side Only

B-9.2.3.1 Type B toilet has the following characteristics (see Fig. 76 and Fig. 77):

- Lateral transfer only from one side;
- Manoeuvring space reduced by washbasin;
- Independent water supply beside water-closet, with floor drain where necessary;
- Ability to reach small wash hand basin when seated on toilet;
- Horizontal grab rail on wall beside the water-closet;
- Vertical grab rail on wall beside the water-closet for getting up and sitting down (slanted grab bars are not preferred);
- Foldable grab rail; and
- Toilet paper dispenser fixed on the wall beside the water-closet.

B-9.2.3.2 Type B accessible toilet room shall meet the following requirements (see Fig. 76):

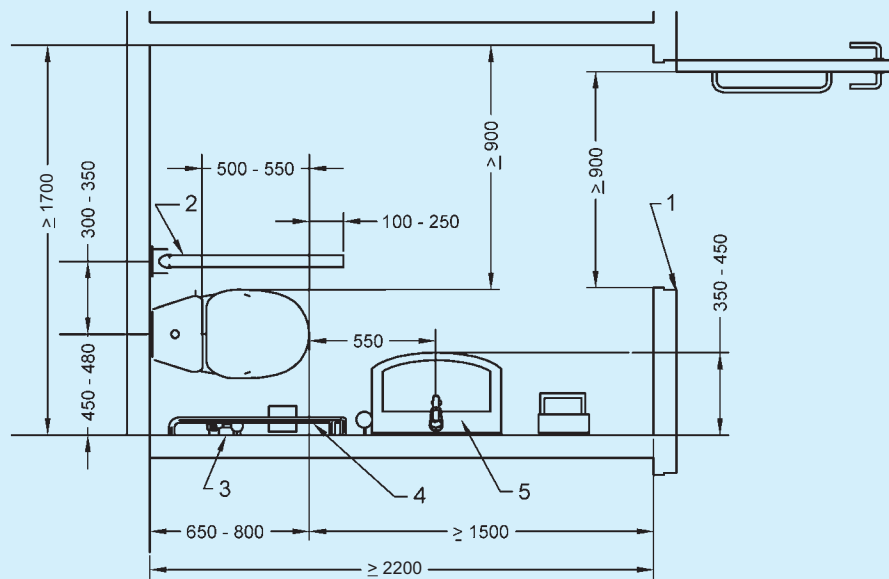
- It shall have minimum internal dimensions of 1 700 mm × 2 200 mm.
- It shall have all fixtures and utilities arranged in a manner to provide a clear space of 900 mm × 1 350 mm for wheelchair users to access them.
- It shall have clear space of not less

than 900 mm wide next to the water-closet.

- It shall be equipped with a door complying with **B-9.4**.
- It shall have a water-closet complying with **B-9.5**, grab bars complying with **B-9.6** and washbasin complying with **B-9.7**.
- It shall have essential washroom accessories complying with **B-9.8**.
- It shall have an alarm to seek emergency help, complying with **B-9.12**.
- It shall have the toilet roll dispenser and hand water faucet mounted below the grab bars and at not more than 300 mm from the front edge of the seat and at a height between 50 mm and 200 mm from the top of the water-closet seat.
- Cloth hooks should be set at different heights, 900 mm to 1 100 mm, and additionally at least one hook at 1 400 mm; and projecting not more than 40 mm from the wall.
- Where possible, be equipped with a shelf of dimensions 400 mm × 200 mm fixed at a height of between 900 mm and 1 000 mm from the floor.

B-9.3 WC Compartments for Ambulant Disabled People

These compartments meet the needs of ambulant disabled people who require support (see Fig. 78 and Fig. 79).

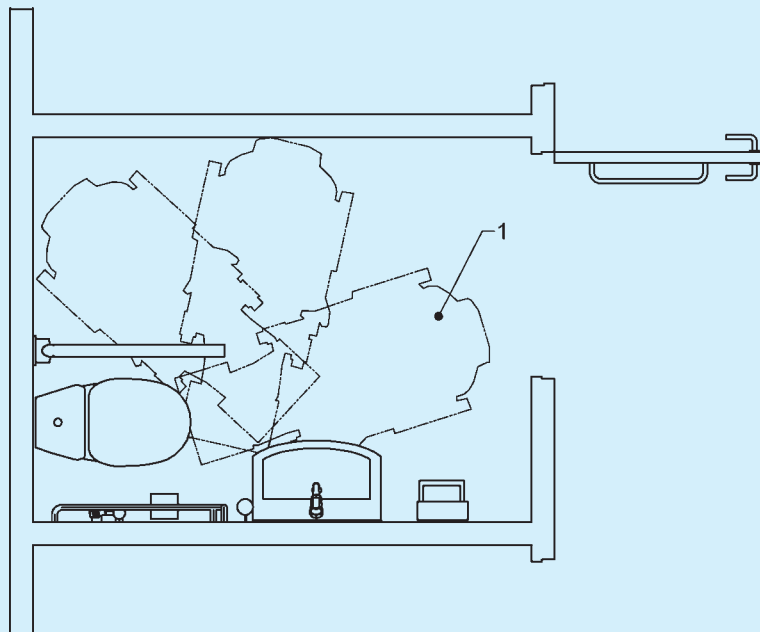


Key

- 1 Minimum 900 mm
- 2 Foldable grab bar
- 3 Independent water supply
- 4 Grab bar on wall
- 5 Washbasin

All dimensions in millimetres.

FIG. 76 EXAMPLE OF TYPE B CORNER TOILET ROOM — LATERAL TRANSFER FROM ONE SIDE ONLY



Key

- 1 Possible transfer positions

FIG. 77 TYPE B TOILET ROOM TRANSFER OPTIONS

This type of compartment is not for the majority of people who use wheelchairs. When located in a single-sex washroom, hand washing facilities will be available communally. Where this is a standalone facility, hand washing facilities shall be provided either in a space adjacent to the WC compartment or in a compartment suitably enlarged to accommodate a wash hand basin.

Such WC compartments shall meet the following requirements:

- It shall have a clear manoeuvring space of minimum 900 mm × 900 mm in front of the toilet.
- It shall be equipped with a door complying with **B-9.4** and opening outwards.
- Water-closet shall comply with **B-9.5**.
- Grab rails complying with **B-9.6**, horizontal and vertical shall be provided on both sides of toilet.
- It shall have other toilet accessories and fittings complying with **B-9.8**.
- It shall have independent water supply beside water-closet, preferably a hand held toilet spray and floor drain, where necessary (see **B-9.9**).

B-9.4 Toilet or Sanitary Room Doors

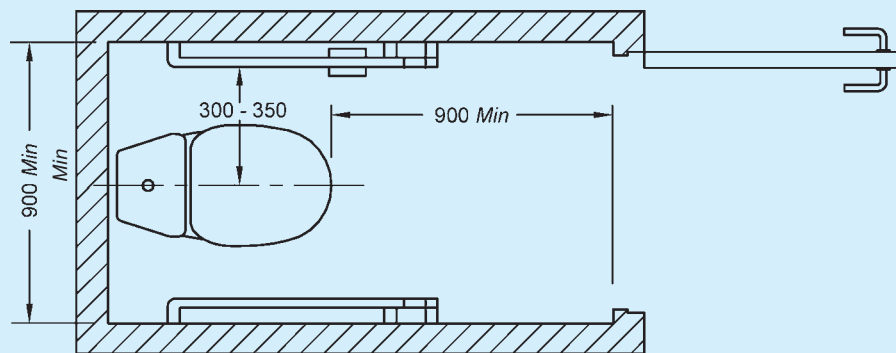
Toilet or sanitary room doors shall comply with **B-5.3**. The toilet door shall either be an outward opening door or two way opening door or a sliding type and shall provide an unobstructed and clear opening width of at least 900 mm; it shall be easy to open and close. There should be no openings under or above the door that compromises on privacy. Doors should be positioned so as not to constitute a hazard.

The toilet door shall be provided with a horizontal pull-bar, at least 600 mm long, on the inside of the door, located so that it is 130 mm from the hinged side of the door and at a height of 900 mm to 1 000 mm. A horizontal pull handle on the inside of the outward opening doors shall be provided at a height of 700 mm above the floor. The door shall be capable of being locked from the inside by a device that is operable by one hand, activated by a force not more than 22 N and which does not require fine finger control, tight grasping, pinching or twisting of the wrist.

B-9.5 Water-Closet

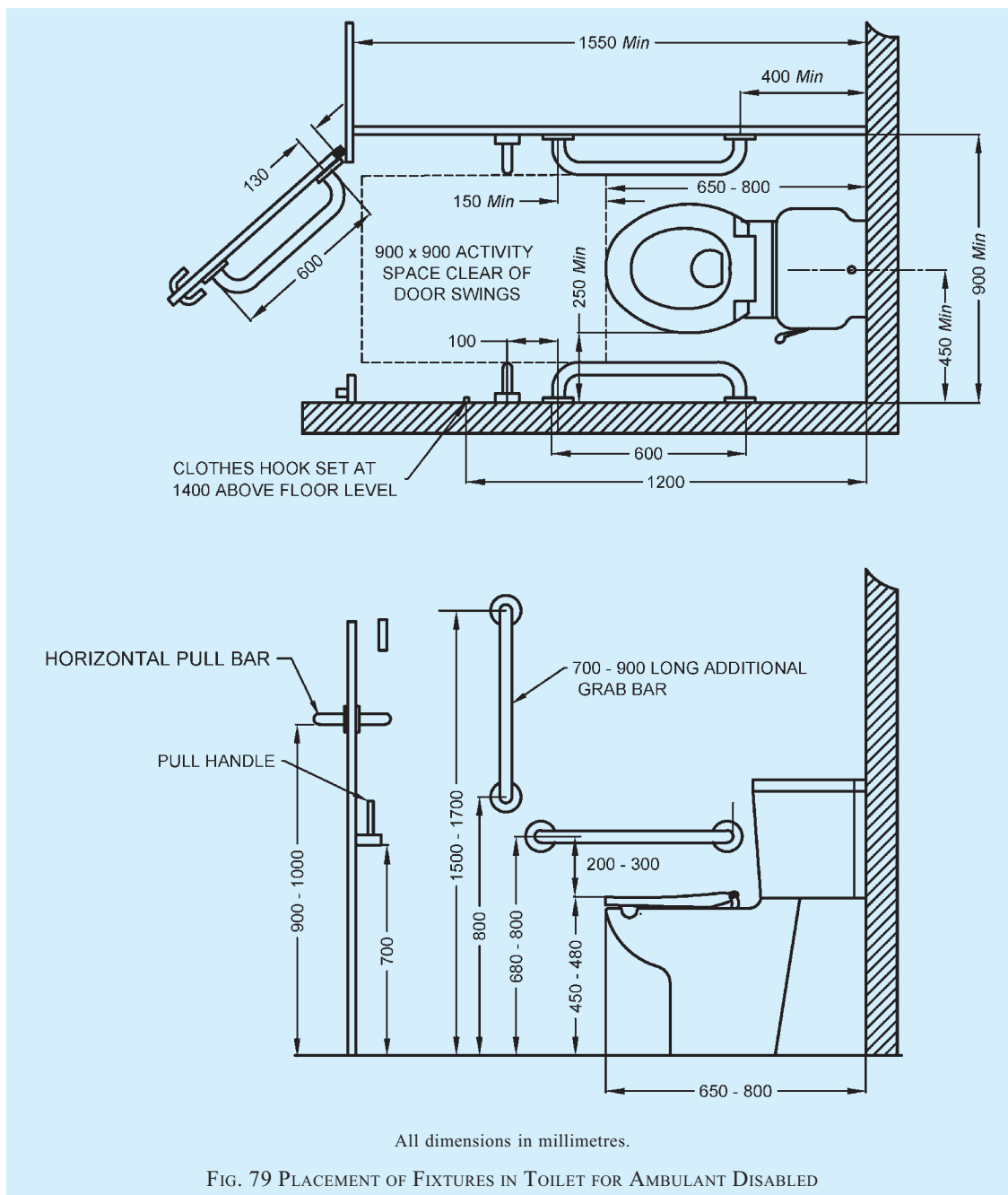
Water-closet shall comply with the following requirements:

- It shall be so located that the distance between centreline of the water-closet to the adjacent wall in case of corner toilets (Type B) be between 450 mm and 480 mm. The minimum distance of a corner toilet from the edge of the WC seat to the adjacent wall should be 250 mm. In case of Type A toilet, the distance from the edge of the WC seat to the adjacent wall shall be 900 mm, minimum on both sides to allow ease of transfer.
- The top of the water-closet shall be between 450 mm and 480 mm from the floor.
- The minimum distance from the front edge of the water-closet to the rear wall should be between 650 mm and 800 mm.
- There shall be an adequate clear floor space of at least 1 300 mm depth and 900 mm width, both in front and on the transfer side, adjacent to the water-closet.
- There shall be a suitable back support to reduce the chance of imbalance or injury



All dimensions in millimetres.

FIG. 78 TOILET FOR AMBULANT DISABLED WITH L-SHAPED GRAB BAR



- caused by leaning against exposed valves or pipes. The distance from the seat to the backrest should range between 500 mm and 550 mm.
- The water-closet shall preferably be of wall-hung or corbel type as it provides additional space at the toe level.
 - Where water cistern is used, the cover shall be securely attached and the flush control shall either be lever type or automatic, and located on the transfer side of the water-closet. The

flush control shall not be located more than 1 000 mm from the floor.

- Toilets for children should have a distance from the centre line to the adjacent wall between 305 mm and 380 mm and the water-closet height shall be between 205 mm and 380 mm.

B-9.6 Grab Bars

Grab bars complying with B-5.5.3 shall be provided in toilet or sanitary rooms in accordance with this clause.

On both sides of a toilet, a grab bar (whether drop-down or fixed to the wall) shall be provided at a distance between 300 mm and 350 mm from the centre line of the toilet.

On the sides where a lateral transfer is possible, a foldable grab bar (drop-down support bar) shall be provided at a height of 200 mm to 300 mm above the water-closet. The length of the foldable grab bar should overlap the front edge of the water-closet in between 100 mm and 250 mm. The positioning of a foldable grab bar should allow access from a wheelchair when folded up.

Where a wall is beside the toilet, a horizontal grab bar shall be provided at a height of 200 mm to 300 mm above the water-closet, and a vertical grab bar shall exceed from the horizontal grab bar to a height of 1 500-1 700 mm above floor level. The grab bar shall extend a distance of minimum 150 mm to the front edge

of the water-closet.

Alternatively, one L-shape grab bar, 600 mm long horizontal and 700-900 mm long vertical shall be mounted on the side wall closest to the water-closet, as illustrated in Fig. 80.

The horizontal grab bar shall be uninterrupted for its full length.

The positioning of accessories such as hand towel, soap, waste bin, etc, should not hamper the use of the grab bar.

The grab bar height for toilets for children should be between 510 mm and 635 mm.

B-9.7 Washbasin

A washbasin complying with following requirements shall be provided within an accessible toilet room (see Fig. 81):

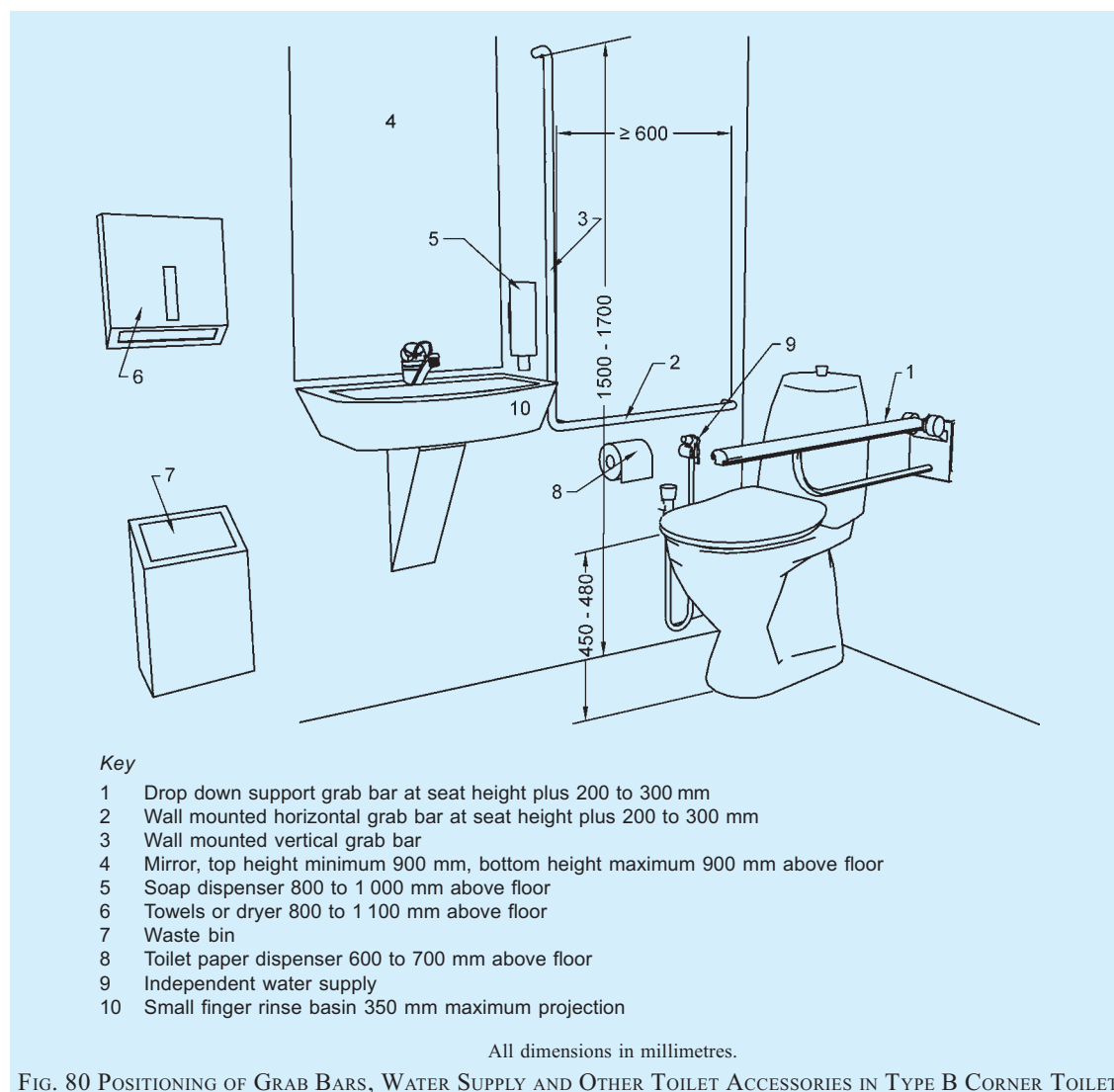
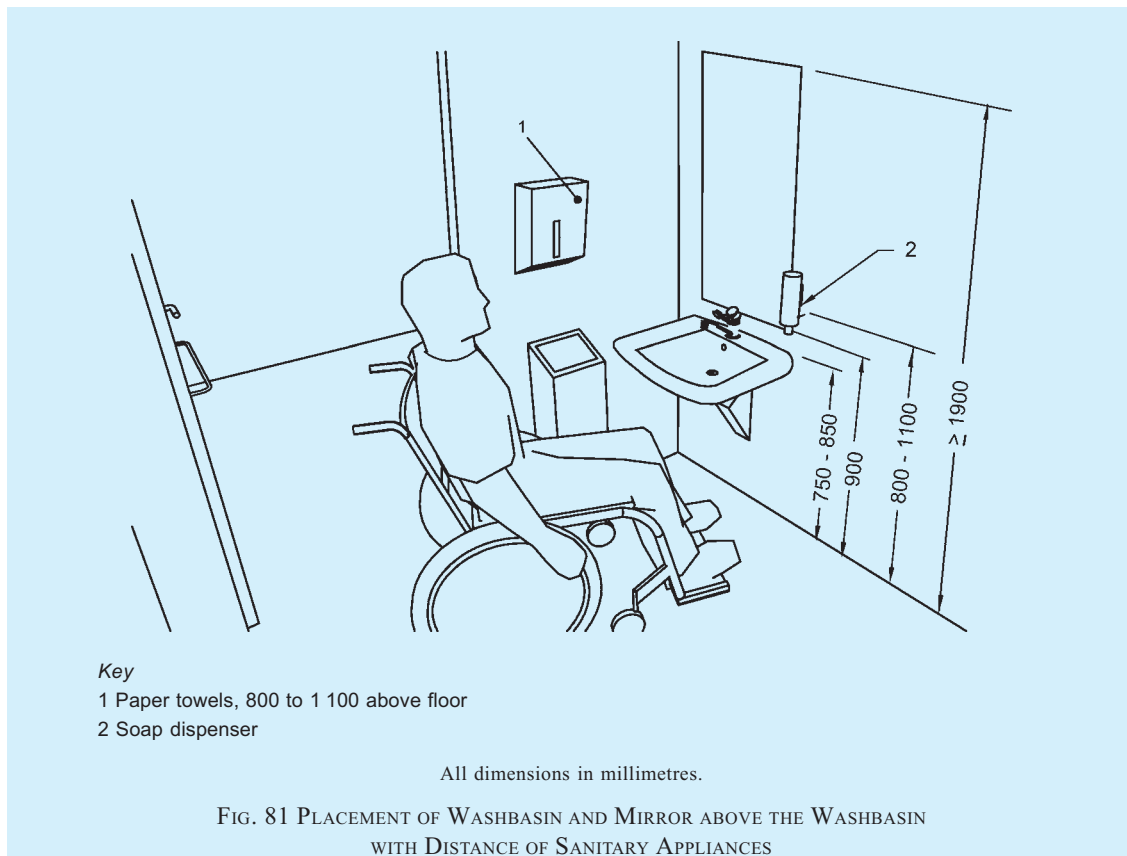
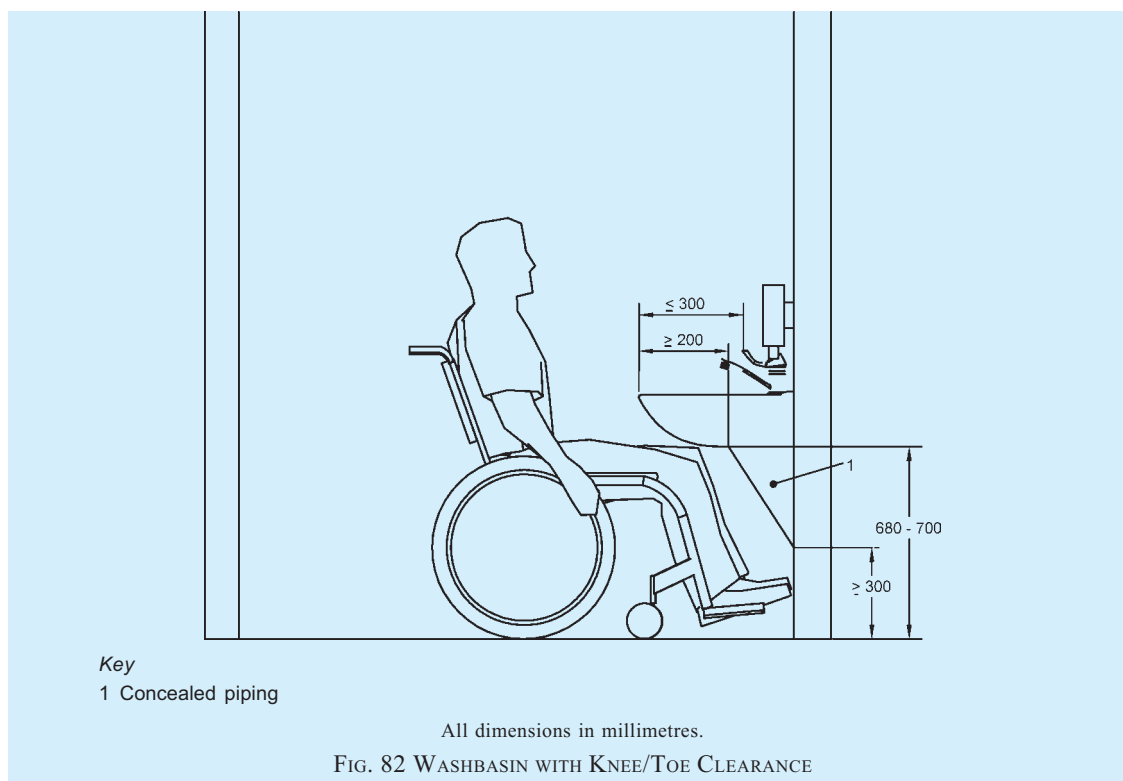


FIG. 80 POSITIONING OF GRAB BARS, WATER SUPPLY AND OTHER TOILET ACCESSORIES IN TYPE B CORNER TOILET

- a) The positioning of a washbasin should allow access from a wheelchair. It shall provide a minimum clear floor space of 900 mm wide by 1 200 mm deep, of which a maximum of 480 mm in depth may be under the washbasin.
- b) It shall be mounted such that the minimum distance between the centreline of the fixture and the side wall is 460 mm; and the top edge of the washbasin is between 750 mm and 850 mm from the floor.
- c) The differences in stature may require lower or higher heights of washbasins and it may be advisable to have an inbuilt flexibility to increase or decrease height.
- d) The space under the washbasin shall be unobstructed with a knee clearance centred on the washbasin between 680 mm and 700 mm high, and 200 mm deep. In addition, a toe clearance of at least 300 mm high shall be provided (*see* Fig. 82). The front edge of the washbasin shall be located within a distance of 350 mm to 600 mm from the wall, according to Fig. 74.
- e) The hot water and drain pipes within the knee space or toe space shall be properly insulated.
- f) Automatic or lever type faucets/taps shall be provided complying with **B-9.10**.
- g) In front of the washbasin, space should allow for a frontal or oblique approach by a wheelchair. The reaching distance to the tap control shall be a maximum of 300 mm, according to Fig. 82.
- h) Edges on washbasins should be rounded.
- j) The mirror above the washbasin shall be positioned to have the bottom edge at a height of not more than 900 mm above the floor, up to a height of 1 900 mm (*see* Fig. 81). If a second mirror is provided, the maximum height above the floor should be 600 mm, up to 1 850 mm. The mirror shall be tilted at an angle of 30° for better visibility of wheelchair user. Care shall be taken in placing mirrors and lights to avoid confusion and dazzling for visually impaired users.
- k) A shelf with minimum dimensions of 200 mm × 400 mm should be provided near the washbasin at a height of 850 mm, or combined with the washbasin.





B-9.8 Other Toilet Accessories and Fittings

All other fittings, for example the water tank, hand dryer, towel, soap dispensers, waste bins, hand-held shower, etc, should be set at a height between 800 mm and 1 100 mm from the floor (*see* Fig. 80). Coat hooks should be set at different heights, 900 mm to 1 100 mm, and additionally at least one hook at 1 400 mm. Accessories shall be placed in close proximity to the basin, to avoid a person with wet hands wheeling a chair.

Dispensers for toilet paper shall be reachable from the water-closet, either under the grab bar or on the side-wall of a corner toilet at a height between 600 mm and 700 mm from the floor (*see* Fig. 80).

Light switches should be fixed inside all accessible toilet cubicles or the lighting should automatically switch on when someone enters the room. Timed light switches should not be installed or used.

Needle boxes to safely dispose of needles (for example from diabetes patients) should be provided.

If a sanitary bin is supplied, it should be reachable from the water-closet. Sanitary bins with non-touch opening devices are preferred.

Non-touch soap dispensers are preferred.

B-9.9 Water Supply

An independent water supply (hand-held shower) shall be provided next to the toilet. An alternative such as a

combination bidet and rear side pan/built-in bidet can be installed.

B-9.10 Taps

Taps should be mixer, lever or sensor operated to aid operation, complying with requirements given in B-7. The tap controls should be set no more than 300 mm from the front of the washbasin. It is recommended that a thermostat be installed to limit the temperature of the hot water to a maximum of 40°C in order to prevent scalding. Hot and cold water taps should be identifiable by both colour and tactile markings.

B-9.11 Urinals

Wheelchair users may be able to pull themselves to a standing position to use a urinal, or they may be able to use a urinal from their wheelchair. Ambulant persons with disabilities, for example crutch users, may need support in front of urinals. Bowl urinals are preferable to slab urinals for the benefit of visually impaired.

When wall hung urinals are fitted in the washroom, it is recommended that at least one of these have its rim set at a height of 380 mm for wheelchair users and at least one have its rim set at a height of 500 mm for standing users/ambulant disabled. When installed, both should be equipped with a vertical grab rail. Urinals shall be minimum 360 mm deep measured from the outer face of the urinal rim to the back of the fixture.

The lower urinal position as shown in Fig. 83 is also beneficial to a person of lower stature. Where an

accessible urinal is provided, the accessible approach to the same shall be ensured. This wall hung urinal should be set clear above the floor level, without any raised access platform and with a clear floor area in front of the urinal of at least 760 mm wide and 1 220 mm deep to allow forward approach for ambulant disabled and minimum of 900 mm × 1 350 mm for wheelchair users to use the urinals (see Fig. 84). Urinals should contrast visually with the wall to which they are attached.

B-9.12 Alarm

An assistance alarm, which can be reached from changing or shower seats, from the WC and by a person lying on the floor, shall be provided in all accessible toilets and accessible sanitary rooms. This alarm should

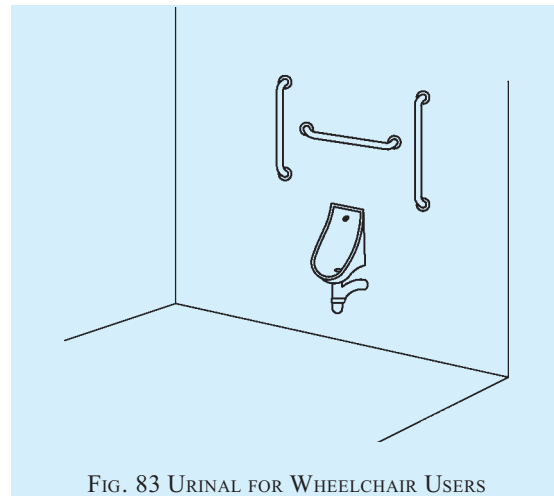
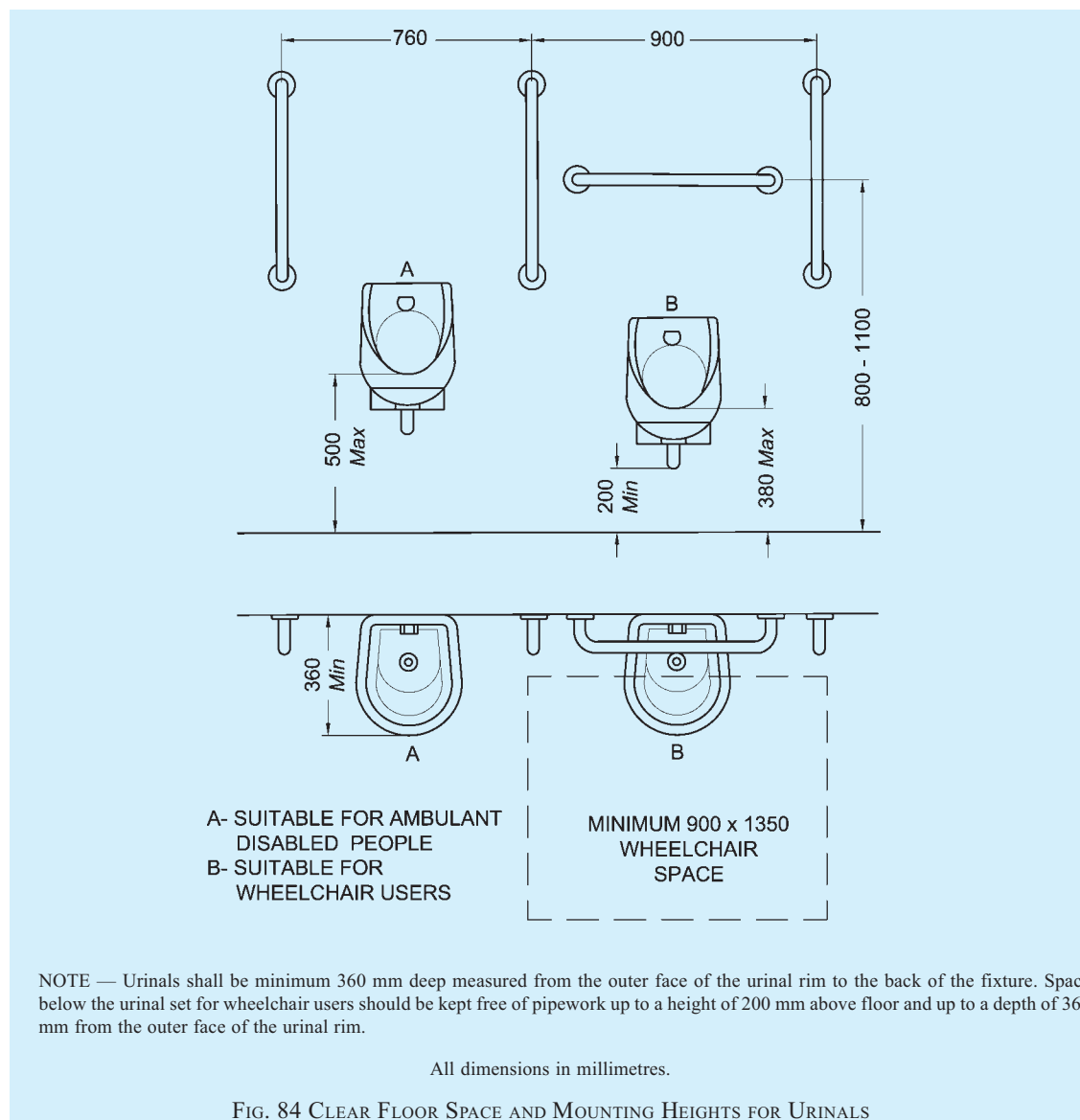


FIG. 83 URINAL FOR WHEELCHAIR USERS



be connected to an emergency help point, or where a member of staff can assist.

Visual and audible feedback should be provided to indicate that, when the alarm has been operated, the emergency assistance call has been acknowledged and action has been taken.

It should take the form of a pull cord, coloured red, with two red bangles of 50 mm diameter, one set at a height between 800 mm and 1 100 mm and the other set at 100 mm above floor level.

A reset control shall be provided for use if the alarm is activated by mistake. It shall be reachable from a wheelchair and, where relevant, from the WC, the tip-up seat in a shower or changing facility, or the bed in an accessible bedroom. The reset control shall be easy to operate and located with its bottom edge between 800 mm and 1 100 mm above floor level.

For a corner toilet room, the reset button should be above the fixed horizontal grab rail beside the toilet paper holder.

The marking of the reset control shall be both visible and tactile.

B-9.13 Emergency Warning Alarm

A visual emergency alarm shall be provided to alert people who are deaf or hard of hearing in the event of an emergency.

B-9.14 Shower and Changing Rooms

Showers and changing rooms can be used by people with different disabilities and different supporting aids, for instance, wheelchair users, ambulant disabled people, etc, using their own wheelchairs or special shower chairs.

B-9.14.1 Shower/Changing Room Size and Space

The shower/change area shall have level entry and have no fixed elements that prevent front and side access.

A self-contained individual shower room or changing room shall have minimum interior dimensions of 2 000 mm × 2 200 mm (see Fig. 85 and Fig. 86). See **B-9.14.6** for other requirements of individual shower room.

A shower room incorporating a corner accessible toilet room shall have minimum interior dimensions of 2 400 mm × 2 500 mm (see Fig. 87). In such cases, the manoeuvring areas may overlap, as shown in Fig. 87.

The minimum clear floor space or wet showering area should be 900 mm × 1 350 mm, with a transfer area of also 900 mm × 1 350 mm in the shower room (see Fig. 88).

If two or more shower recesses are provided, at least one shall have the seat on the opposite side.

B-9.14.2 Shower Floor and Drainage

The floor in the shower recess shall have a gradient between 1:50 and 1:60 sloping to a floor drain. The area outside the shower recess shall have a gradient between 1:70 and 1:80 draining towards the shower recess.

The floor of the shower shall be slip-resistant even when wet.

The transition into the shower recess shall be level without a step down or a kerb. Where unavoidable the kerb shall not be more than 12 mm high bevelled at a slope of 1:2.

The waste outlet should be centrally located and be a round type outlet, not a channel type, to ensure the stability of the shower chair.

B-9.14.3 Shower Seat

The shower should be fitted with a wall mounted, easily operable foldable seat that folds in an upward direction. If a foldable seat is provided, its minimum size shall be 450 mm × 450 mm, and, when folded down, have its top surface set between 450 mm and 480 mm above finished floor and spaced a maximum of 45-50 mm from the rear wall.

The shower seat shall be positioned such that the distance between the centerline of the shower seat and the adjacent wall is 450 mm to 480 mm, and the distance between front edge of the shower seat and the rear wall is 650 mm.

Enclosures for the shower cubicle shall not obstruct transfer from wheelchair onto shower seat.

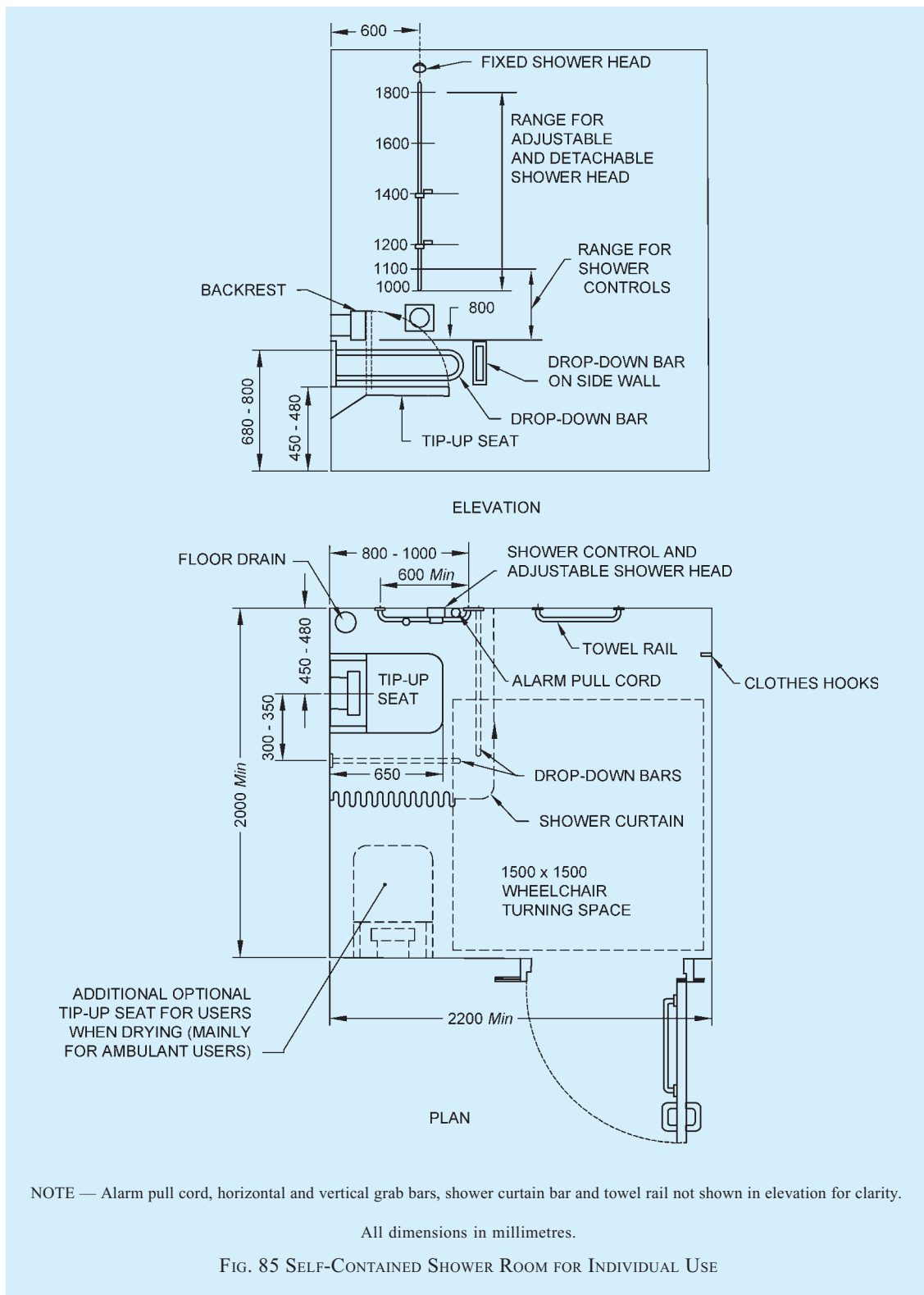
The fastenings for grab bars and the construction of the foldable seat shall be able to withstand a force of 1.1 kN applied at any position and in any direction.

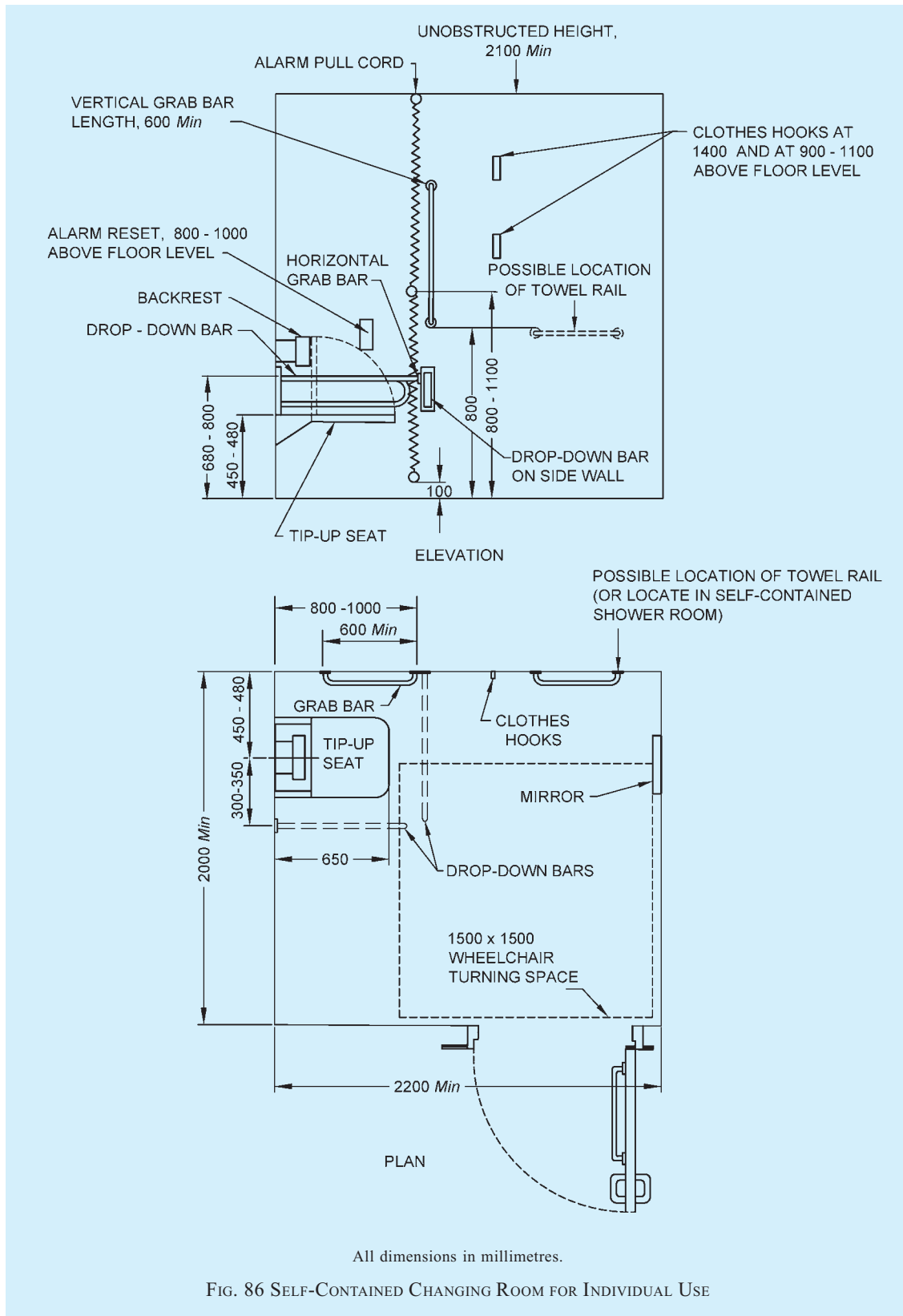
NOTE — Shower wheelchairs are sometimes used instead of shower seats.

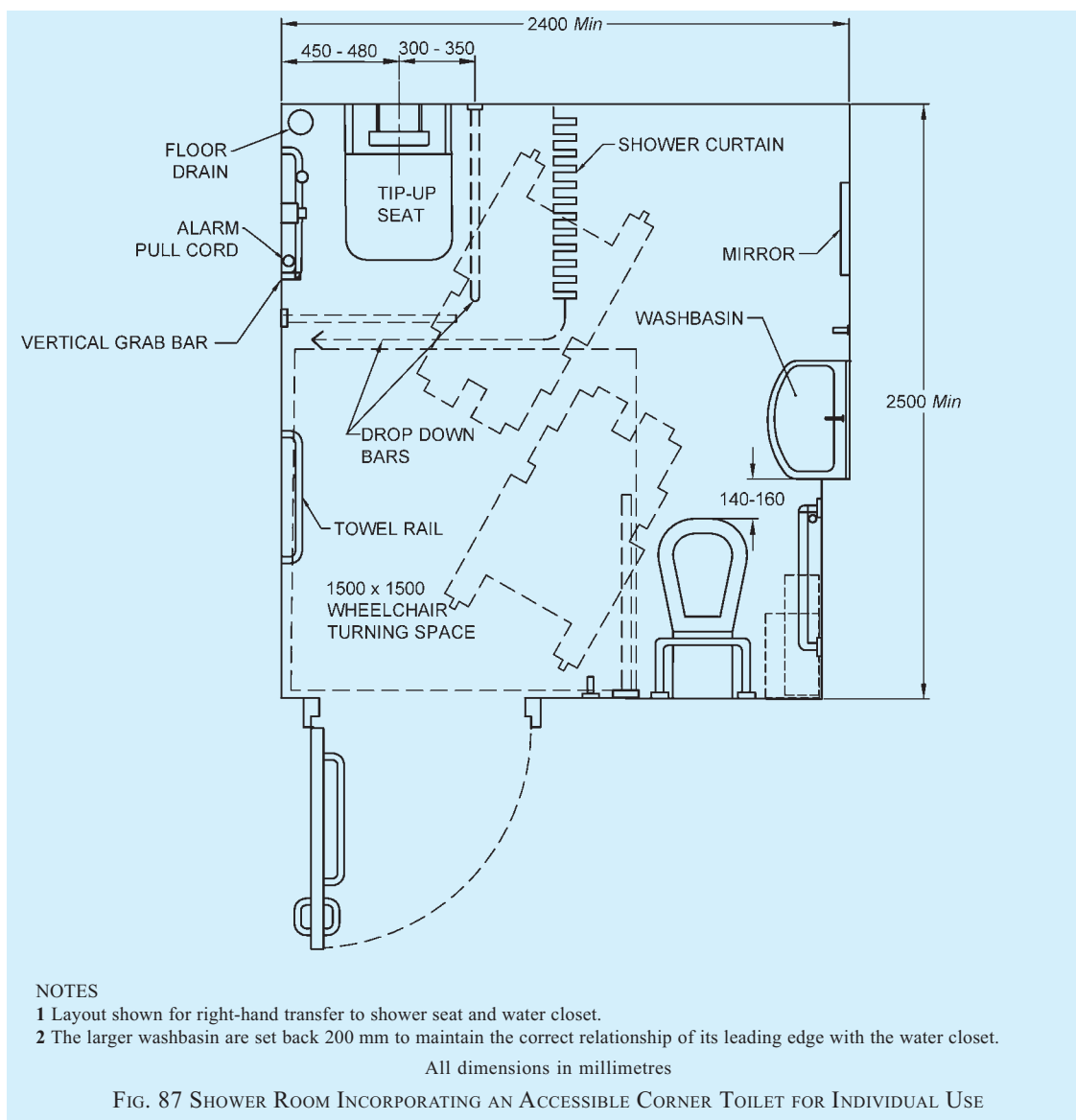
The foldable seat shall have the following features:

- a) Self-draining;
- b) Slip-resistant and stable;
- c) Foldable in an upwards direction; when folded, it shall not present a hazard and the grab rail shall be accessible from the foldable seat;
- d) Rounded front corners (radius 10 mm to 15 mm); and
- e) Rounded top edges (minimum radius of 2 mm to 3 mm).

The foldable seat should preferably be height adjustable.







B-9.14.4 Grab Bars

Grab bars in shower shall be set according to **B-9.6** and Fig. 87. The shower area shall be fitted with at least one vertical grab bar which may hold the flexible shower head.

B-9.14.5 Stationary, Fittings and Accessories

The length of the flexible (adjustable and detachable) shower hose (telephone shower/ handheld shower), shall be 1 500 mm minimum. The handheld shower head should be provided between 1 000 mm and 1 200 mm above the finished floor. The shower hose fitting should be a minimum 1 300 mm above floor level.

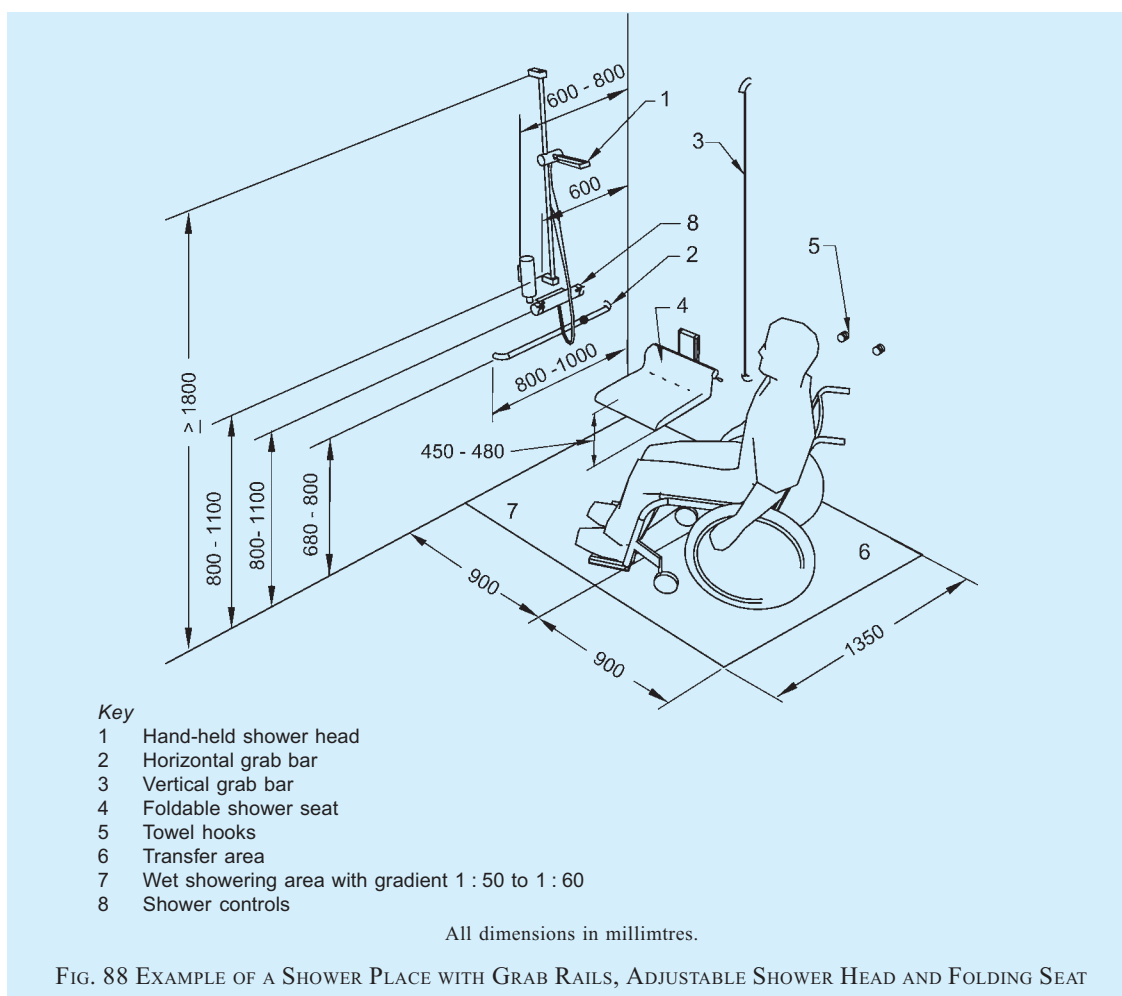
Shower controls and folding seat shall be set according to Fig. 88. Controls shall comply with **B-7**.

The shower room shall be equipped with a door complying with **B-9.4**. Assistance alarm(s) shall be provided in accordance with **B-9.12**.

B-9.14.6 Individual Shower Room

A clear floor space of at least 1 350 mm × 900 mm shall be provided on the clear side of the foldable seat, to allow access from a wheelchair, in addition to the manoeuvring space of 1 500 mm (see Fig. 85).

The screening of a shower recess shall be either a curtain or a door system that maintains the required circulation and manoeuvring space and does not interfere with the level entry.



A shower head support grab bar shall be fixed on the wall in the position shown in Fig. 88.

A hand held detachable shower head shall be provided with a flexible hose of minimum length 1 200 mm, and it shall be able to reach within 100 mm of the shower floor.

An adjustable shower head holder shall be provided to support the shower head, and shall,

- a) be installed on the shower head holder support grab bar as shown in Fig. 88;
- b) allow the graspable portion of the shower head to be positioned at various angles and heights; and
- c) allow the graspable portion of the shower head to be located at heights between 1 000 mm and 1 800 mm above the finished floor.

The fastenings, materials and construction of the seat shall withstand a force of 1.1 kN applied at any position and in any direction.

Grab bars shall be fixed on the walls in the positions shown in Fig. 88. All other devices, for example taps,

soap holder, shall be situated in an accessible range between 900 mm and 1 100 mm.

B-9.15 Public Toilets

Public toilets shall also comply with the overall requirements under **B-9** with respect to the facilities provided therein so as to ensure that the same are accessible. In all public toilets, the following shall be provided:

- a) Male section shall have one urinal with support grab bars for ambulant disabled and at least one urinal for children at a lower height;
- b) Both male and female section shall have one WC for ambulant disabled;
- c) One Type A unisex accessible toilet room with independent entrance; and
- d) Depending on footfall, one Type B accessible toilet in both male and female toilet groups.

B-9.16 Contrast and Lighting

Fixtures and fittings in sanitary facilities should visually

contrast with the items and surface on which they are positioned. Use of the same colour everywhere, for example white basins and white tiles, etc, shall be avoided and colour and tonal contrast should be used to differentiate elements in the environment.

Light switches should be fixed inside all accessible toilet cubicles or the light should automatically switch on when someone enters the room. Timed light switches should not be installed or used.

The minimum illumination measured at 800 mm above floor level shall be 200 lux in the area of the washbasin.

B-9.17 Floor Surface

The floor surface shall be slip resistant, anti-glare and firm.

B-9.18 Signage

Signage shall be clearly visible incorporating the international symbol of accessibility and shall comply with the requirements given in B-24. Signage for unisex accessible toilet, toilet for ambulant disabled, unisex change rooms or fitting rooms, unisex shower rooms shall be as shown in Fig. 89. Signage for Type B accessible toilet shall also indicate available transfer option, that is, right hand or left hand as shown in Fig. 90.

B-10 RECEPTION AREAS, COUNTERS, DESKS AND TICKET OFFICES

B-10.1 Hearing and Lip-Reading

Reception areas, counters, ticket offices, especially in



FIG. 89 SIGNAGE FOR DIFFERENT SANITARY FACILITIES



FIG. 90 SIGNAGE INDICATING TRANSFER OPTIONS (RIGHT HAND OR LEFT HAND) IN UNISEX ACCESSIBLE TOILET

noisy environments or those equipped with a separating security screen, should have at least one position fitted with a hearing enhancement system (for example induction loop system) to assist hearing-aid users, as described in **B-21**, and be clearly marked with the appropriate signage/symbol.

Positioning of service counters in front of windows where bright sunshine may come should be avoided as it causes the user's face to be in shadow and hence difficult to lip-read. Service counters equipped with a service screen are particularly difficult. Reflections and glare should be avoided.

B-10.2 Location

Counters and reception desks should be located and clearly identified so that they are easily recognizable from a building entrance. Information reception areas should be positioned near the main entrance. Entrance flooring systems or tactile ground surface indicators can help in locating reception counters for people who have vision impairment. Such products should be designed to minimize trip and slip hazards.

General design requirements for colour and visual contrast should be considered (*see B-24.3*).

B-10.3 Space to Manoeuvre

Counters, desks and ticket offices should be accessible to wheelchair users on both sides. A clear manoeuvring space at least 1 500 mm × 1 500 mm shall be provided in front of the counter on the receptionist's side and on the visitor's side; 1 800 mm × 1 800 mm is preferred.

B-10.4 Height

B-10.4.1 The counter level shall be between 750 mm

and 800 mm from the floor. Clear knee space underneath shall be minimum 700 mm (*see also Fig. 91*).

B-10.4.2 Reception desks where writing is done by the visitor (for example at hotel receptions) should allow frontal approach by wheelchair users with space to provide clearance for wheelchair user's knees. The counter level and clear knee space underneath shall be as per **B-10.4.1**. At least a part of the desk should also be at a height suitable as a writing place for standing people, between 950 mm and 1 100 mm (*see Fig. 91*).

B-10.5 Lighting

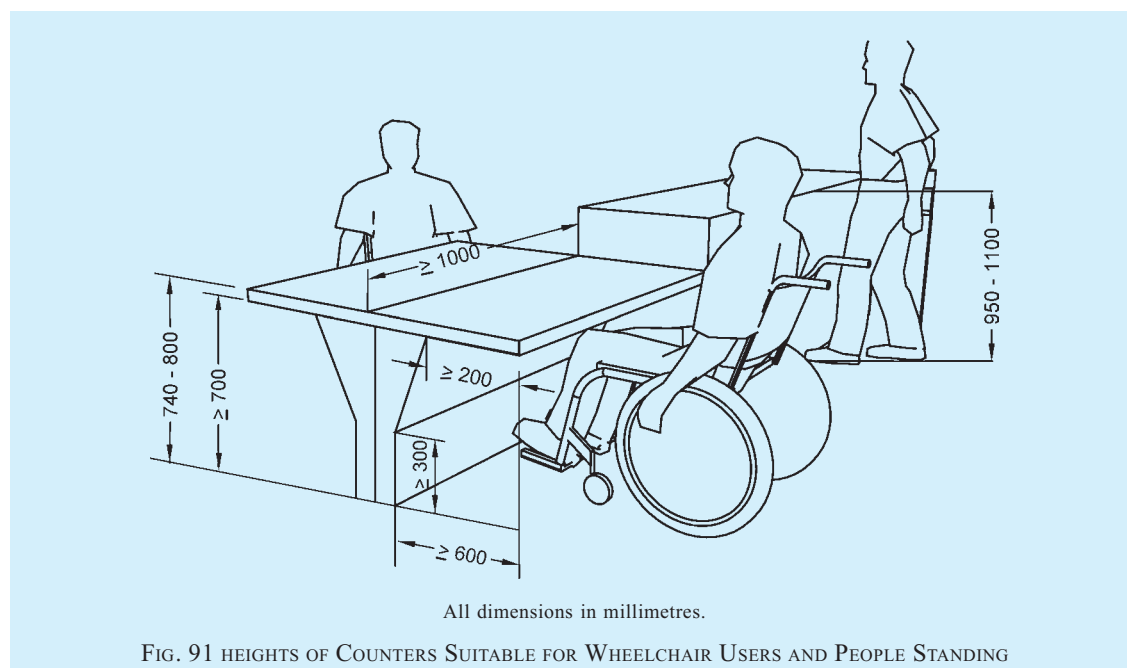
To facilitate lip reading, lighting should provide even illumination. The reading and writing surfaces at counters, desks and ticket offices shall be illuminated to a level of at least 200 lux in the room, and on the desk in a range of 350 lux to 450 lux.

B-10.6 Ticket Systems

If a queue number ticket system is used, it shall be suitably designed to be accessible. All control devices shall be located according to **B-7**. All necessary information shall be given in simple wording with sufficient visual contrast and based on the two-sense-principle (*see B-7, B-21, B-24.1.2, and B-24.3*). The ticket machine and the calling system shall provide visual and audible output.

B-11 CLOAKROOM

Attended cloakrooms are staffed rooms where bags/luggage/other articles can be stored securely. Typically, a ticket or receipt is given to the customer, with a



corresponding ticket attached to the garment or item. A cloakroom shall comply with the requirements given for reception/counters (*see* **B-10**).

B-12 AUDITORIUMS, CONCERT HALLS, SPORTS ARENAS AND SIMILAR SEATING

B-12.1 Hearing Enhancement Systems

A hearing enhancement system should be provided. The system should also be provided on the stage/platform (*see* **B-21**).

B-12.2 Lighting for Sign Language Interpretation

Adequate provision should be made to facilitate sign language and lip reading. Lighting on the faces and hands of presenters and people signing should be provided at an angle of 45° to 50° from horizontal at ceiling level for people with a hearing impairment to be able to read the presenter's lips and the signer's lips and hands. A suitable contrasting backdrop should be provided, to assist in reading the presenter's lips and hands.

B-12.3 Designated Seating Areas for Wheelchair Users

At least 1 percent of seats shall be designated as seating areas (*see* **B-8** for requirements of seating spaces) for wheelchairs users, with a minimum of two.

For total seats exceeding 51, it is recommended to provide the designated seating areas in the following manner:

- Total seats 51 to 100, minimum three designated seating areas for wheelchair users;
- Total seats 101 to 200, minimum four designated seating areas for wheelchair users; and
- One additional seating area should be provided for every two hundred additional seats or part thereof.

These spaces should be integrated among other seats and allow two wheelchair users to stay together. It is recommended that the armrest on the seats at the end of the row lift up to allow people to transfer from the wheelchair onto a seat. To accommodate groups of wheelchair users, in an auditorium with fixed seats, a minimum of 15 seats shall be foldable or removable to increase the number of designated areas for wheelchair users when necessary.

Some seats should be wider in order to allow larger size people to sit properly.

B-12.4 Access to Stage and Backstage

Access to the stage and to the backstage area shall be

provided. Adequate provision should be made to direct the user to the designated spaces.

B-12.5 Row and Seat Numbers

The row and seat numbers should be legible to people who have impaired vision. They should be tactile, of adequate size and have enough visual contrast to the background on which they are mounted. The requirements given in **B-24** should also be considered.

B-12.6 Accessible Changing Rooms

The minimum number of accessible changing rooms should be provided depending on the type and use of the building.

In the event that changing rooms are provided alongside a toilet area, these should comply with the specifications given in **B-9.14**.

A fixed bench should be set at a height of 450 mm to 480 mm above floor level. The bench should be no less than 500 mm wide, 2 000 mm in length, and be provided with a grab bar at a height of 700 mm to 800 mm with a clearance of between 50 mm and 65 mm from the wall.

A clear space of 1 500 mm × 1 500 mm shall be beside the bench.

Coat hooks should be set at different heights, 900 mm to 1 100 mm, and additionally at least one hook at 1 400 mm.

Coat hooks, benches, locker handles and other furnishings should offer good colour and tonal contrast to their backgrounds. Non-slip floor surfaces should be used, and good lighting as well as matte finished surfaces and furnishings should be provided.

An alarm/call bell/switch may be provided (*see* **B-9.12**).

Changing rooms shall have a minimum area of 4 m².

B-13 CONFERENCE ROOMS AND MEETING ROOMS

The requirements for sufficient acoustic provision shall be provided in conference rooms and meeting rooms. Accessible toilet facilities, as per **B-9** should be as near as possible to such rooms. A sound augmentation system should be provided. Reverberation time for speech, music, etc, should be as per Part 8 'Building Services', Section 4 'Acoustics, Sound Insulation and Noise Control' of the Code.

All equipment in conference rooms shall be usable by people chairing or participating in the meeting and shall be at a height between 800 mm and 1 000 mm. *See also* **B-7** for requirements of controls and operating devices.

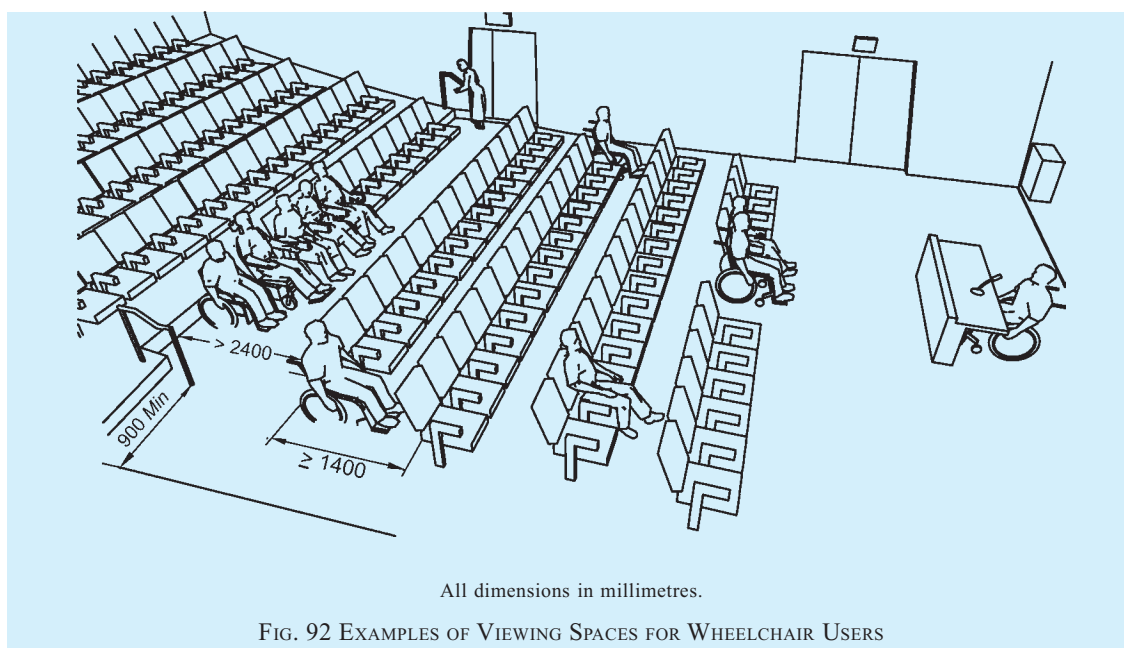


FIG. 92 EXAMPLES OF VIEWING SPACES FOR WHEELCHAIR USERS

B-14 VIEWING SPACES IN ASSEMBLY AREAS

B-14.1 Floor Area

The floor area for a wheelchair viewing space shall be connected to an accessible path of travel and shall meet the following requirements (see Fig. 92):

- It shall be at least 900 mm × 1 400 mm;
- The depth of the row shall be minimum 2 400 mm;
- It shall have clear and level surface;
- It shall have sufficient manoeuvring space;
- Spaces for several wheelchair users shall be provided. They shall be located beside regular seating rows, for the wheelchair user to be able to stay by his/her accompanying person, if relevant; and
- It is recommended that the armrest on the seats at the end of the row (aisle seats) lift up to allow wheelchair users to transfer from the wheelchair onto a seat.

Some seats should be provided with foldable armrests, considering transferences (see B-12.3); some other seats should be wider, considering larger size people.

B-14.2 Sight Lines

Wheelchair user viewing spaces shall provide viewing spaces that are,

- comparable to those for all viewing positions with a minimum unobstructed eye level up to 1 200 mm; and

- not reduced or obstructed by standing members of the audience.

Row and seat number identification signs shall be legible to persons who are visually impaired (see B-24).

B-15 BARS, PUBS, RESTAURANTS, ETC

In restaurants a minimum of 25 percent of the tables shall be usable by wheelchair users according to B-8.3. In bars, a minimum of 25 percent of bar counters shall not be more than 800 mm height, and shall have an unobstructed lateral access for wheelchair users.

Sufficient manoeuvring space between tables and the route to the accessible toilet facilities shall be provided.

The general design requirements for colour and visual contrast should also be considered, as described in B-24.3.

In self service restaurants, tray slides and counters shall be mounted at 800 mm from the floor for wheelchair users. Food shelves shall be mounted at a maximum height of 1 200 mm and aisle space of minimum 900 mm shall be provided. Where stools and high tables are provided, low tables suitable for wheelchair users shall be provided. Cantilevered table or tables with straight legs at each corner are preferable to central pedestals that might restrict wheelchair access.

B-16 TERRACES, VERANDAS AND BALCONIES

Terraces, Verandahs and balconies shall be accessible to all people, including people with mobility impairments.