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भारतीय मानक

स्वच्छता उपकरणों के चुनाव, संस्थापन और
रखरखाव की रीति संहिता

(दूसरा पुनरीक्षण)

Indian Standard

SELECTION, INSTALLATION AND
MAINTENANCE OF SANITARY APPLIANCES —
CODE OF PRACTICE

(*Second Revision*)

UDC 696.14.006.76

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Water Supply and Sanitation in Building Sectional Committee had been approved by the Civil Engineering Division Council.

Installation of sanitary appliances in any public or private building is usually governed by municipal bye-laws and rules thereunder. These are intended to regulate proper layout of the appliances and their connections so that wastes are suitably disposed off to drains without causing insanitary conditions and nuisance to public. Noting the variations in the bye-laws and rules framed by different authorities in the country, this Indian standard was first published in 1962 and subsequently revised in 1973 to ensure fulfilment of minimum requirements. This revision of the standard provides more details of various dimensions necessary for fixing in position of various sanitary appliances. The revision incorporates reference to new/latest Indian standards.

Sketches have been included which show typical layout of sanitary fixtures in water closets, bathrooms, kitchens, etc. They are only illustrative and are not intended to limit the design to the types shown.

Indian Standard
**SELECTION, INSTALLATION AND
 MAINTENANCE OF SANITARY APPLIANCES —
 CODE OF PRACTICE**
(Second Revision)

1 SCOPE

1.1 This standard covers the selection, installation and maintenance of sanitary appliances.

1.1.1 This code should be read in conjunction with IS 2065 : 1983, IS 1742 : 1983 and IS 1172 : 1992.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 TERMINOLOGY

3.0 For the purpose of this standard, the following definitions shall apply.

3.1 Sanitary Appliances

An appliance fitted to drainage system for the collection of discharge of soil or waste water.

3.1.1 Soil Appliance

A sanitary appliance for the collection and discharge of excretory matter.

3.1.2 Waste Appliance

A sanitary appliance for the collection and discharge water after use for ablutionary, culinary and other domestic purposes.

3.2 Water Closet

A water flushed plumbing fixture designed to receive human excrement directly from the user of the fixture. The term is used sometimes to designate the room or compartment in which the fixture is placed.

4 PRELIMINARY DATA FOR SELECTION OF APPLIANCES

4.1 The position of the sanitary compartment, annexes, etc, shall be determined by consultation between the architect and the sanitary engineer while planning in the early stages. To ensure proper selection of sanitary appliances in number and kind, the sanitary engineer shall be provided with information as to the number and types of occupants who use the building. Water pressure shall be taken into account when selecting valves and fittings.

5 TIME SCHEDULE

5.1 Fixing positions of appliances shall be established prior to the commencement of building construction. As much work as possible needed in the assembly of appliances shall be prepared and fitted during the progress of the erection of the building before surface finishes are carried out.

5.2 Soil, waste and ventilating branch connection with supporting brackets, shall be fitted before the erection of the appliances is begun. Appliances except those permanently built-in shall not be fixed until floor and wall surfaces are finished and ready for decoration.

6 MATERIALS**6.1 Appliances and Components**

All sanitary appliances and their components shall be durable, impervious, corrosion resistant and have smooth surface which may be easily cleaned. They shall conform to relevant Indian Standard where they exist, otherwise they shall be of the best quality and workmanship which shall be approved by a competent authority.

7 DESIGN CONSIDERATIONS**7.1 Kitchen**

The kitchen has many uses, it is used for preparation of meals, food preservation, storage of food and utensils and also in many cases for eating and laundering.

Since more time and efforts are frequently spent in the kitchen than in any other area of the house, careful planning is especially important. This requires proper selection of appliances and storage units and convenient arrangement of the area.

Some general planning guidelines are given in 7.1.1 to 7.1.9.

7.1.1 Arrangement

It will be important to keep the basic work area compact and consideration shall be given to the possibility of more than one person working there. The arrangement shall vary according to the size and shape of the space available, but the relationship among the functions in the different work areas shall not be ignored.

7.1.2 Storage

The design of the kitchen shall be functional in the sense of minimizing reaching and stooping. The storage facilities shall not be higher than a user can reach with both feet flat on the floor. Adequate space to store items, so that they may be easily seen, reached grasped and taken down and put back without strain. Storage space shall be sufficiently flexible to permit its adjustment to varying amounts, sizes and kinds of food and utensils. It shall be preferred to provide adjustable shelvings.

7.1.3 Cooking Work Tops

The height of work tops shall permit a comfortable working postures. The cooking top, where gas stoves are employed, the height of finished level shall not be more than 750 mm from finished floor level and in case of other stoves like kerosene pressure stove it shall not be less than 700 mm. Due consideration shall be given for storage of bottled gas (cylinder) if need be floor level under the cooking top shall be lowered to accommodate the height of the cylinder gas. Normally height of bottled gas 14 kg does not exceed more than 725 mm with collar and holding rings.

7.1.4 Work Tops

Work top height shall not exceed more than 800 mm from the finished floor level. The depth shall not be more than 600 mm. The width of the cooking as well as the work top may vary according to shape and size of the kitchen but in any case shall not be less than 900 mm for each activity.

It is recommended to avoid storage facility above the cooking top. The high level storage facility open or lockable may be provided under the work top.

7.1.5 Materials

Materials and finishes that minimize maintenance and cleaning shall be used.

7.1.6 Lighting

Comfortable level of light with minimum shadow shall be planned throughout the kitchen. Adequate day light or artificial lighting shall make the room more agreeable. One side of the kitchen shall have exposure to the external open space.

7.1.7 Ventilation

Kitchen shall have well natural ventilation as provided in National Building Code of India 1983. If need be it shall be ventilated with mechanical means to remove objectionable kitchen odours.

7.1.8 Safety

Burns, scalds, falls and explosions shall be designed out of kitchen. Sharp corners, exposed handles and

control knobs on the kitchen equipments shall be avoided. There shall be safety catches on doors and drawers to limit the exploratory activity of the young children.

7.1.9 Critical Dimensions

Critical horizontal and vertical dimensions are indicated in the Fig. 1.

7.2 Bath Rooms

Bath room is a space where washing of face, hands and hairs, bathing, eliminations and grooming and also such activities as hand laundering and infant care is carried out. Often it is used as a dressing room.

Design of bath room shall include planning for optimum convenience and privacy and for all members of the household. It needs adequate provision for storage and equipment and ease of cleaning.

Some general planing guidelines are given in 7.2.1 to 7.2.7.

7.2.1 Arrangement

Facilities shall be conveniently arranged with special attention to clearance. The room arrangement shall permit more than one function.

7.2.2 Illuminations

Lighting shall be adequate for all the activities performed. Direct source of light shall be provided with high strip windows, clear storey windows and sky lights. Luminous ceilings and artificial lighting are recommended.

7.2.3 Ventilation

Good ventilation shall be essential to reduce humidity and to dispel odours. Care shall be exercised in its selection and placement of windows as ventilation.

7.2.4 Materials

It shall be essential that all the surface materials used in the bath room shall have moisture resistance finishes and non-slippery floors.

7.2.5 Safety

Grab bar shall be used vertically for bath tub and shower and shall be located for convenient use. They shall be of adequate size and security fastened to sturdy backing or studs. Floor finish shall be of non-skid. Door lock that opens automatically from inside and outside shall be installed in case of emergency. Light switches shall be located out of reach of bath and shower.

Critical dimensions and clearances required for the fixtures and fittings are given in Table 1 (see Fig. 2 and Fig. 3) (See IS 3489:1985 and IS 6411:1981)

Table 1 Space Clearance Required for Wash Basins, W.C. and Bath Tub
(Clause 7.2.5)

Wash Basin		Minimum	Adequate
Width	Centre axis to adjacent wall	510	560
	Side edge to side of adjacent tub	50	50
Depth	Front edge to opposite wall	760	900
	Front edge to opposite tub	530	760
W.C.			
Width	Centre axis to adjacent wash basin	350	360
	Centre axis to adjacent tub	410	460
	Centre axis to adjacent wall	410	460
Depth	Front edge to opposite wall	410	600
	Front edge to opposite tub	530	600
	Front edge to opposite wash basin	600	760

7.2.6 Miscellaneous Activities

The bath room shall also be planned for hygienic purpose in addition to other activities such as infant bath, laundry, washing of clothes and storage of water, linen, etc, and particularly for squatting bath. Minimum space needed to bath and dress an infant shall be 480 mm deep, 1 500 mm wide and for an adult bath minimum 1 200 mm² or diameter space is needed. Floor space shall be left in every bathroom or W.C. for portable accessories desired by the owner or needed on occasion for ease of infants or individual.

7.2.7 Doors and Windows

Bath room door can be smaller but not less than 700 mm wide to permit passage of equipment as required. Door swings should so arranged that:

- it shall not strike any person using any fixture.
- it shall be away from shower.
- it may not shield or conceal the W.C.
- door may swing outside for small bath rooms.

The size and position of bath window should meet the requirements of light and ventilation and privacy. General higher window with glazed louvred is preferred in hot and humid regions.

7.3 Bidet

The provisions of bidet is often a luxury. The materials needed for manufacture may be earthenware or fire clay or G.R.P. or metal. The minimum space dimensions for installation of bidet shall be 900 mm in width and 1 300 mm in depth. This appliance is generally installed very near to W.C. The spacing between W.C. and bidet shall not be less than 800 mm from central axis of both appliances and minimum 600 mm from front edge of the bidet. Bidet with mixer and anti-scalding device shall be given preference.

7.4 Shower

Ready made shower tray for standing bath or sunken floor for squatting bath shall be individual's. Sunken bath floor level shall not be more than 60/70 mm.

Shower head height shall be governed by users height, may be overhead for men only 1 750 mm, however, 150 mm clearance shall be provided for above overhead. Minimum 1 900 mm is recommended for men; 1 830 mm for female and 1 675 mm for children; projection of shower shall vary according to design and shape. In case of shower, projected from wall, it shall not be more than 450 mm and height not exceeding 2 200 mm from floor level. The shower valves or mixing valves shall be placed near entrance to shower. Shower curtain rod shall be optional (see IS 781:1984 and IS 1701:1960).

7.5 Toilet

Toilet consists of minimum three fixtures such as shower stall/bath tub, wash basin and water closets. It is common practice to provide four fixtures, like tub and shower stall, wash basin/dressing counter and water closets. Luxurious type toilet consists of five fixtures name bath tub, shower stall, water closet, bidet and counter fitted with wash basins, with full length of mirror. The arrangement of these fixtures are made with due consideration to clearances and piping system (see Fig. 3).

7.6 Water Closets

Generally squatting type W.C. seats/pans are very common in rural and urban areas. However, the provision of western type i.e. down flash type of W.C. seats in toilet is popular in metropolitan towns among the users suffering from arthritis, or piles etc. Water closet space should accommodate not only the pan but also a provision for water tap, tumbler, wall pegs, toilet paper holder, flushing valves, cistern high or low and storage for cleansing agents etc. Some times water closets seat is used as a reading space also by few users, needs more than minimum floor area. The design of W.C. shall include planning for optimum convenience and privacy for all the members of the family.

Some general planning guidelines are given in 7.6.1 to 7.6.2 (see Fig. 4) (See IS 2556 Part 7 to 15 and IS 2548 Part 1 and 2 and IS 774:1984 and IS 7231:1984).

7.6.1 Arrangements

W.C. shall be conveniently arranged with special attention to clearances, flushing system and floor trap. The outlet traps ('p'/s') is preferred at the central axis of the W.C. or at right angle in the plan. The location of water tap arrangement shall permit more than one function. In case of western type the position of W.C. and the toilet paper holder shall be made within the convenient reach of users.

7.6.2 Lighting and Ventilation

Good lighting and ventilation shall be essential to illuminate the space and to reduce/dispel odours. Care should be exercised in its selection and placement of window in relation to cistern. The design, shape and size as well as colour of the W.C. shall vary according to taste of the user, however, the minimum dimensions as indicated in Fig. 4 shall be followed.

7.7 Hand Wash Basin

The provision of hand wash basin in housing or in public toilet has become a necessity for personal care. It is generally used in standing posture for washing hands, face, hairs, shaving and also for make-up. The design, shape, size and colour of wash basins are available in varying degrees. The installation of wash basin may be mounted on pedestal or fixed on wall with/without brackets. In case of corner location special type shall be used. Since wash basin forms the part of wet area in the building, careful planning of space as well as proper selection of appliance and convenient arrangement is needed.

Some general planning guidelines are as given in 7.7.1 to 7.7.3 (see Fig. 3 and 5). (See IS 771 (Part 1 to 3) and IS 2556 (Part 1 to 5))

7.7.1 Arrangements

It will be necessary to provide multi use of spaces in a toilet. Due consideration shall be given to the possibilities of more than one person using wash basin at certain time of a day in a house. It will be desirable to provide minimum 500 mm distance from the adjacent obstruction wall to the central axis of wash basin and width; 600 mm from front edge to the opposite/obstruction point to perform various activities. The spacing shall be measured from the central axis of the wash basin irrespective of size and shape. Due care shall be given for fixing outlets for hot and cold water supply taps, stop valves. It shall be proper to follow manufacturer's instructions before wash basin is fixed.

7.7.2 Mirror

It is a common practice to install mirror/medicine cabinet with mirror above wash basin. Occasionally small shelf is also provided for keeping daily use items. The minimum size of mirror shall not be less than 0.20 m and each side not less than 450 mm. The bottom line of mirror shall not be less than 1 200 mm from the finished floor level.

7.7.3 Materials

Materials and finishes that minimize the maintenance and cleaning shall be used.

Some of the critical dimensions are given in Fig. 3 for installation.

7.8 Urinals

Privacy 'from and within' is important criteria for the design of installations in public urinals. The concept of privacy in all culture of society has played a role in the design of fixture and fittings, employed in personal hygiene.

The design and installation of fixtures such as stall type urinals (without partition) and wall hanging urinals with partition often lack the privacy 'within' and arrangement of installation similarly lack privacy 'from' for the users. Therefore, it shall be imperative for the designer to pay attention while planning public conveniences. The concept of squatting type urinals may also be considered particularly for females.

Some general planning guidelines are as given in 7.8.1 to 7.8.3 (see Fig. 6). (See IS 2556 (Part 6/Sec 1 to 6) and IS 2326:1987 and IS 7231:1984)

7.8.1 Arrangement

It shall be important to provide basic elbow space and consideration shall be given to privacy. The arrangement shall vary according to the size and shape of the available space. But proper circulation, movement space, functional use of fixtures and fittings shall not be ignored. Avoid installation of series of wash basins with mirror at right angle or opposite to the urinals. A suitable storage space for brooms, cleaning agents etc, should be made. The location of flushing cistern, screen height, constant water supply should also be taken into account.

7.8.2 Materials

Materials and finishes that minimize the maintenance and cleaning shall be used.

7.8.3 Lighting and Ventilation

Good ventilation shall be provided to dispel odours, if necessary, by artificial ventilation. Care should be exercised in its selection and placement of windows as light source as well as ventilation.

Some of typical dimensions for installation are given in Fig. 6.

8 WORK ON SITE

8.1 Chases and Ducts

A check shall be made to see that all holes, chases and ducts required for pipework have been properly provided.

8.2 Delivery of Appliances

Before delivery of appliances, suitable storage space, which can be retained until the assembly period, should be provided. Upon arrival all appliances shall be carefully checked to ensure that they are in accordance with the requirements and free from defects and damage.

8.3 Siting of Appliances

The outlets of water closet pans and similar appliances shall be examined to see that outlet ends are abutting on the receiving pipes before joining. It is also necessary to make sure that the receiving pipe is clear of obstruction. Attention shall be given to the possibility of movement and settlement from other causes, and also to noise transmission. Overflow shall be so arranged as to give visible warning of discharge and should always have fall to the outlet. When terminating externally, the overflow shall have sufficient projection to throw the discharge clear of the wall, but the projection shall be limited to avoid unsightliness.

8.4 Fixing of Appliances

A check shall be made to ensure that the necessary facilities have been provided for supporting wash basins, sinks and flushing cisterns. Where the built-in types of brackets are used, they shall already have been fixed by the building contractor and where the wall fixing types are involved, the wall finish shall have been arranged to make provisions for them. Care shall be taken when fixing sinks to ensure that they drain satisfactorily to the outlet.

8.5 Protection of Appliances

Care shall be taken at all times, particularly after fixing, to protect appliances from damage. Glazed,

enamelled and plated surfaces of appliances can be irreparably damaged by carelessness during subsequent operations. All orifices should be temporarily plugged during the progress of the work to prevent obstruction. Appliances shall finally be cleaned of all marks of cement, lime, oil, paint, etc.

9 INSPECTION AND TESTING

9.1 Inspection

On completion of the work, all appliances, materials and workmanship shall be carefully examined for defects.

9.2 Testing

Comprehensive tests of all appliances should be made for simulating conditions of use; overflows should be examined for obstructions.

10 MAINTENANCE

10.1 Appliances need frequent cleaning to maintain them in a good sanitary condition and to preserve their appearance.

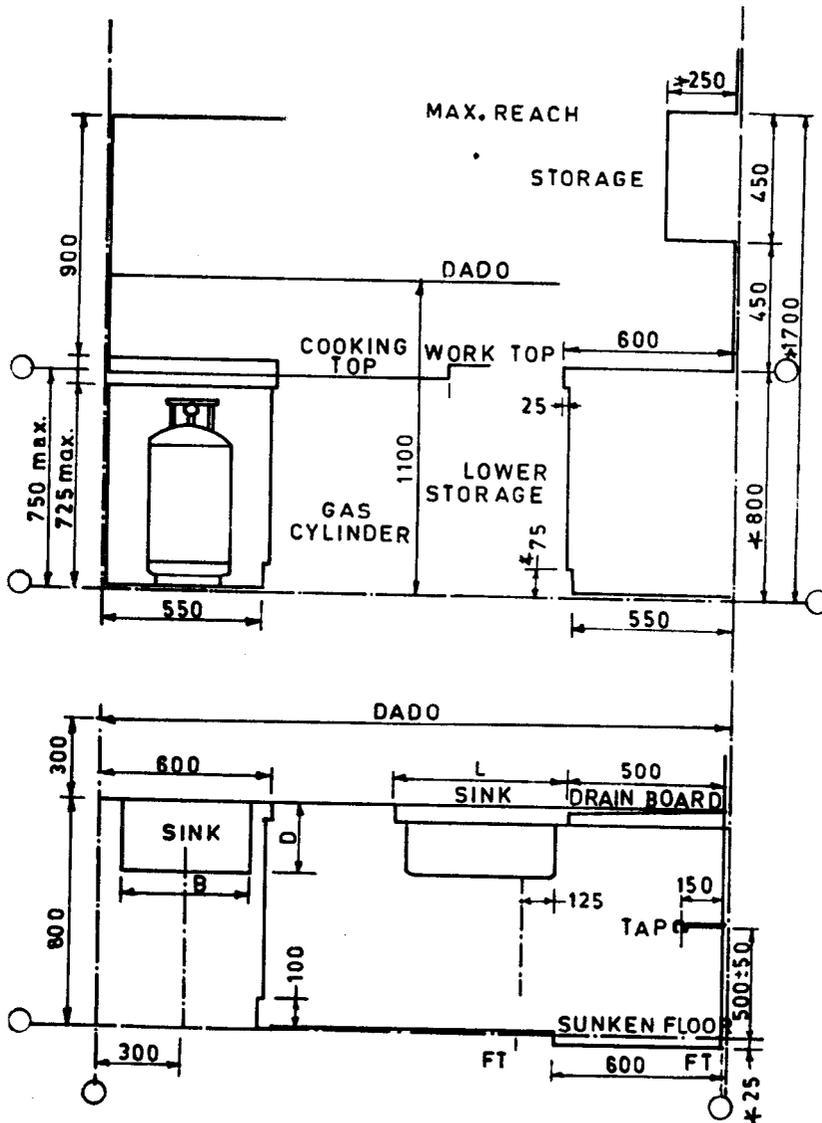
10.2 If cleaning has been neglected, it may be necessary to use a solution of bleaching powder (NaOCl) together with hot water to remove surface stain from ceramicware. To restore the lustre of the porcelain glazed surface, hot water with a paraffin moistened cloth is often successful. Abrasive powders, spirits of salts or other acid solutions are detrimental and should not be used on such surfaces. The renewal of tap and valve washers should receive prompt attention to avoid waste of water and damage to valve sealing and surface of appliance.

ANNEX A

(Clause 2)

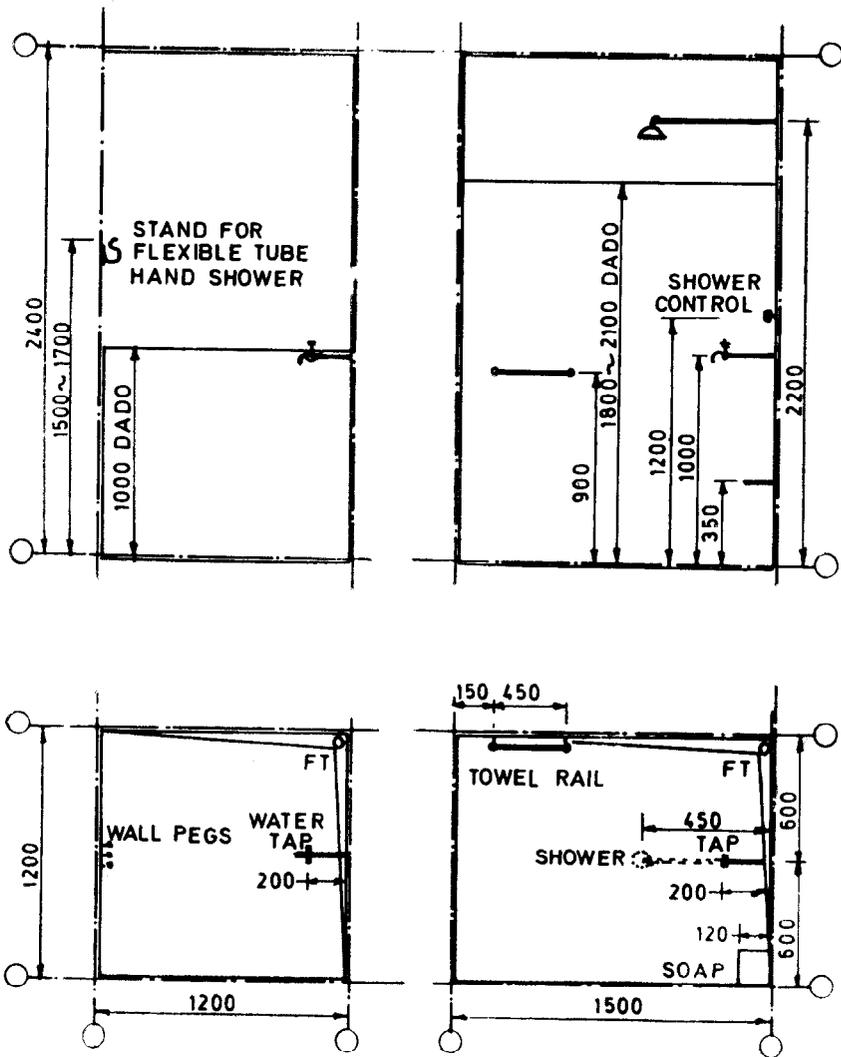
LIST OF REFERRED INDIAN STANDARDS

IS No.	Title
771	Specification for glazed fire clay sanitary appliances
Part 1 : 1979	General requirements
Part 2 : 1985	Specific requirements of kitchen and laboratory sinks (<i>third revision</i>)
Part 3 : 1986	Specific requirements for urinals
774 : 1984	Specification for flushing cistern for water closets and urinals (other than plastic cistern) (<i>fourth revision</i>)
781 : 1984	Specification for cast copper alloy screw down with taps and stop valves for water services (<i>third revision</i>)
1172 : 1992	Code of basic requirements for water supply, drainage and sanitation (<i>fourth revision</i>)
1701 : 1960	Specification for mixing valves for ablutionary and domestic purposes
1742 : 1983	Code of practice for building drainage (<i>second revision</i>)
2065 : 1983	Code of practice for water supply in building (<i>second revision</i>)
2326 : 1987	Specification for automatic flushing cisterns for urinals (<i>first revision</i>)
2548 (Parts 1 & 2) : 1983	Specification for plastic seats and covers for water closets: Part 1 Thermoset seats and covers (<i>fourth revision</i>), Part 2 Thermoplastic seats and covers (<i>fourth revision</i>)
2556	Specification for vitreous sanitary appliances vitreous (China):
Part 1 : 1974	General requirements (<i>second revision</i>)
Part 2 : 1981	Specific requirements of wash-down water-closets (<i>third revision</i>)
Part 3 : 1981	Specific requirements of squatting pans (<i>third revision</i>)
Part 4 : 1972	Specific requirements of wash basins (<i>second revision</i>)
Part 5 : 1979	Specific requirements of laboratory sinks (<i>second revision</i>)
Part 6/Sec 1 : 1979	Specific requirements of urinals, Section 1 Bowl type (<i>third revision</i>)
Part 6/Sec 2 : 1974	Specific requirements of urinals, Section 2 Half stalled urinals (<i>second revision</i>)
Part 6/Sec 3 : 1974	Specific requirements of urinals, Section 3 Squatting plates (<i>second revision</i>)
Part 6/Sec 4 : 1974	Specific requirements of urinals, Section 4 Partition slabs (<i>second revision</i>)
Part 6/Sec 5 : 1974	Specific requirements of urinals, Section 5 Waste fottomgs (<i>second revision</i>)
Part 6/Sec 6 : 1974	Specific requirements of urinals, Section 6 Water spreaders for half stalled urinals (<i>second revision</i>)
Part 7 : 1973	Specific requirements of half round channels (<i>second revision</i>)
Part 8 : 1985	Specific requirements of siphonic wash-down water-closets (<i>third revision</i>)
Part 9 : 1979	Specific requirements of bidets (<i>third revision</i>)
Part 10 : 1974	Specific requirements of foot-rest (<i>second revision</i>)
Part 11 : 1979	Specific requirements for shower rows (<i>first revision</i>)
Part 12 : 1973	Specific requirements of traps for squatting pans
Part 13 : 1973	Specific requirements of traps for squatting pans
Part 14 : 1974	Specific requirements of integrated squatting pans
Part 15 : 1974	Specific requirements of universal water-closets
3489 : 1985	Specification for enamelled steel bath tub (<i>first revision</i>)
6411 : 1985	Specification for gel-coated glass fibre reinforced polyester resin bath tub (<i>first revision</i>)
7231 : 1984	Specification for plastic flushing cistern for water-closets and urinals (<i>first revision</i>)



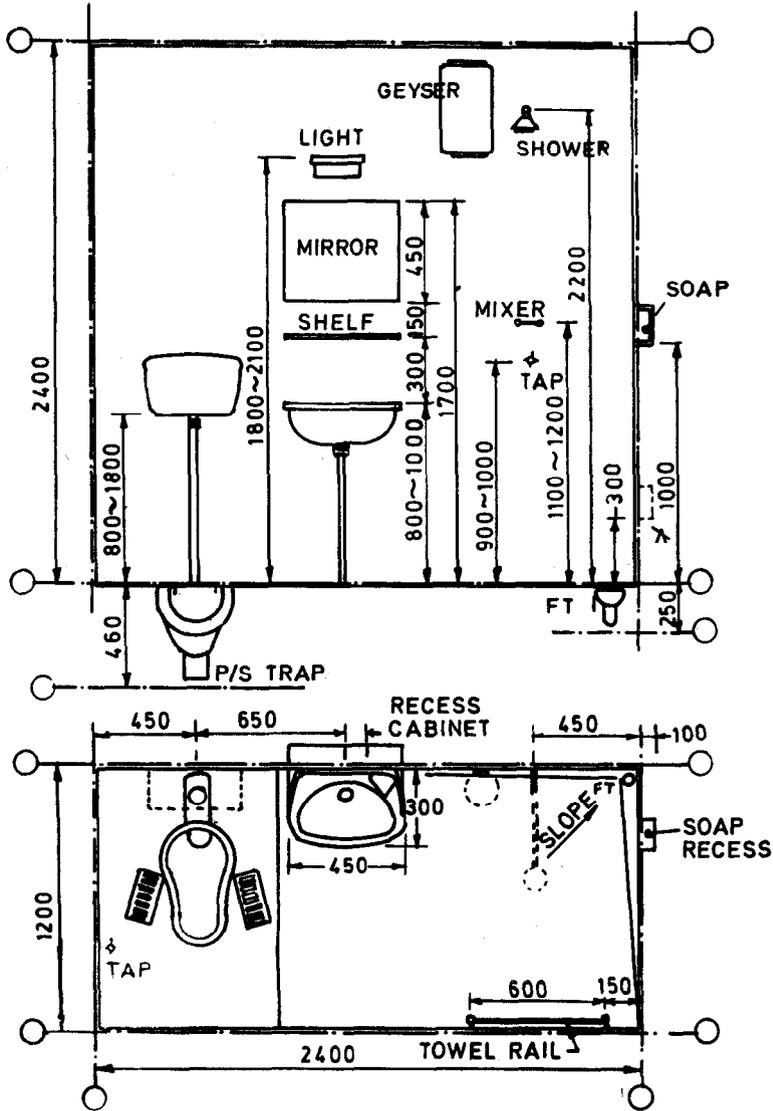
All dimensions in millimetres

FIG. 1 KITCHEN HEIGHTS



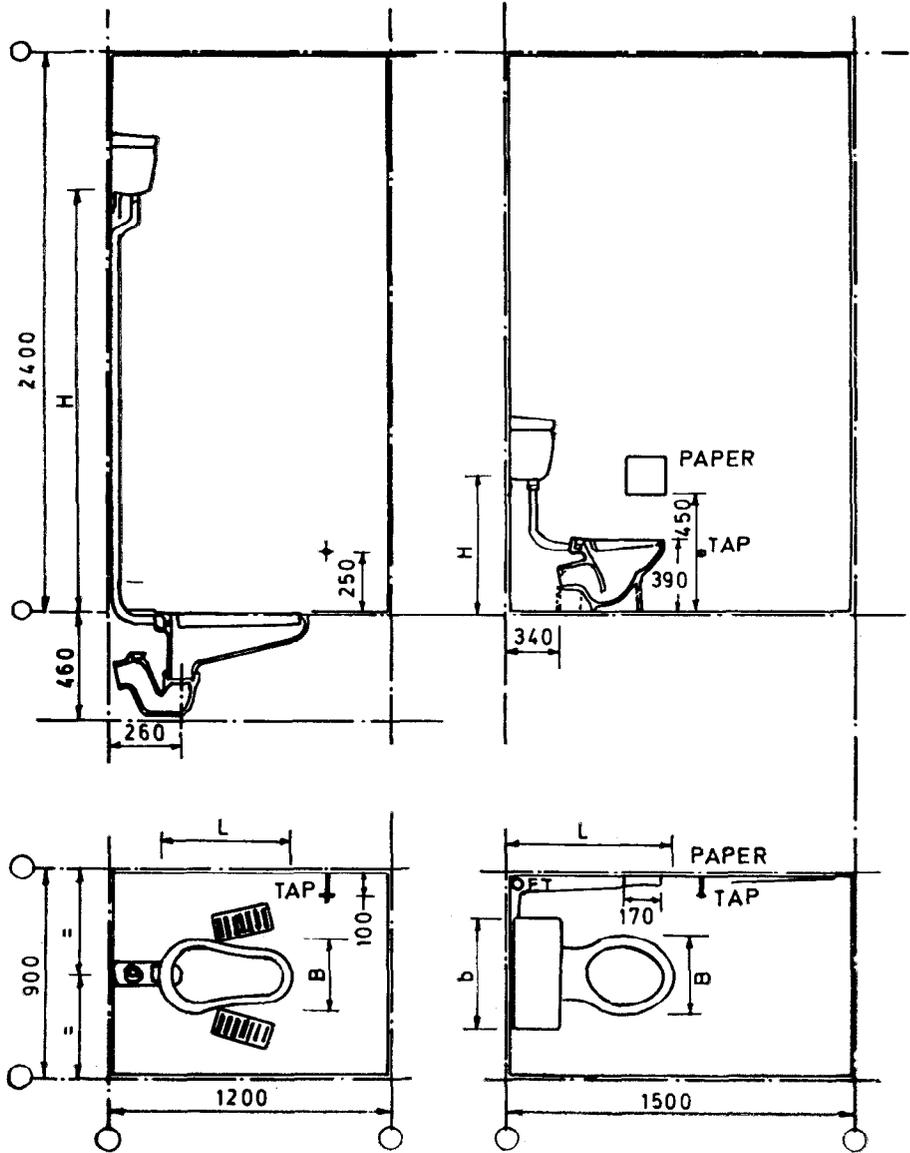
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FIG. 2 BATH ROOM



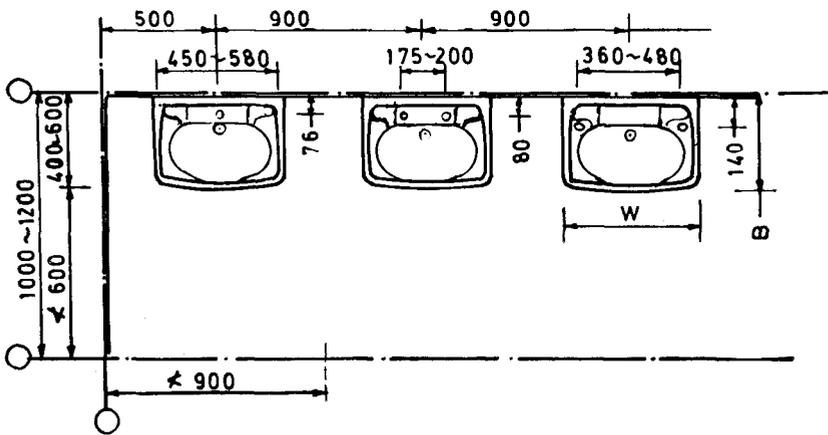
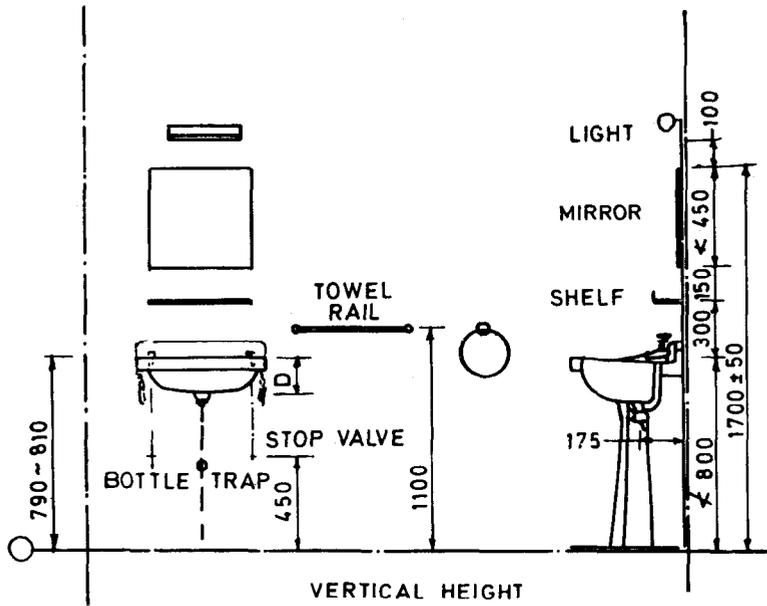
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FIG. 3 TOILET LAYOUT, TYPICAL



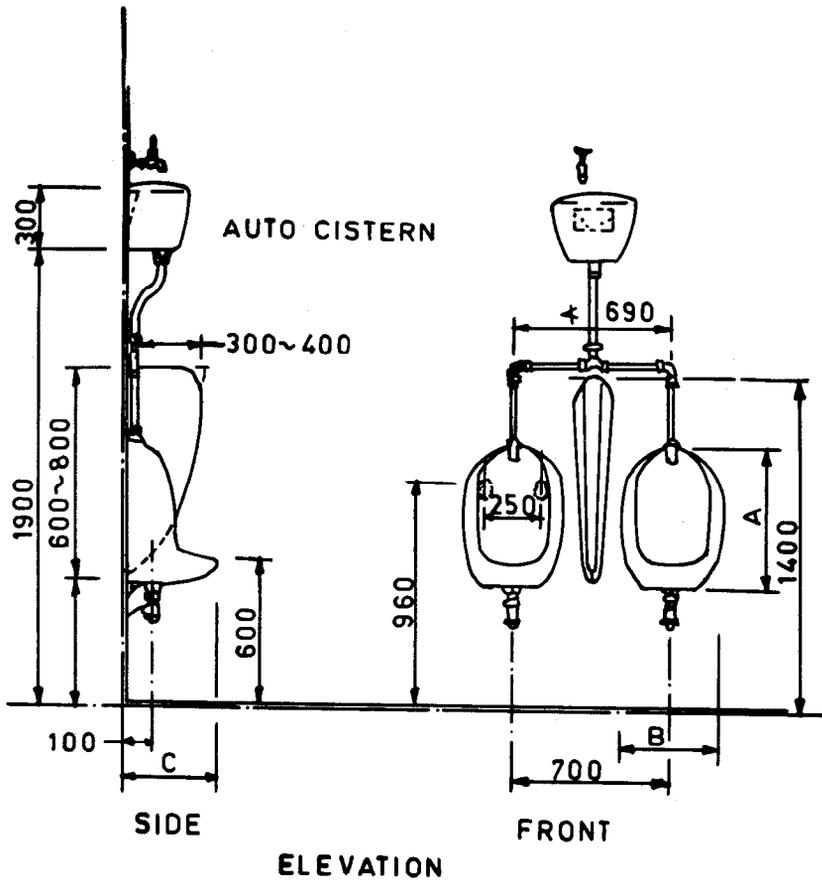
All dimensions in millimetres

FIG. 4 WATER CLOSET TYPICAL ARRANGEMENT



All dimensions in millimetres

FIG. 5 HAND WASH BASINS



All dimensions in millimetres

FIG. 6 URINALS

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Doc : No. CED 24 (4828)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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