PAM Northern Chapter 2021
Webinar Programme

Paper 2
MS 2015-1:2017 Public Toilet – Part 1: Design Criteria (First Revision)

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This Malaysian Standard was developed by the Working Group on Public Toilets under the authority of the Industry Standards Committee on Building, Construction and Civil Engineering.

MS 2015 consists of the following parts, under the general title Public toilets:

Part 1: Design criteria (2017)

Part 2: Inspection criteria (2006)

Part 3: Rating criteria (2006)

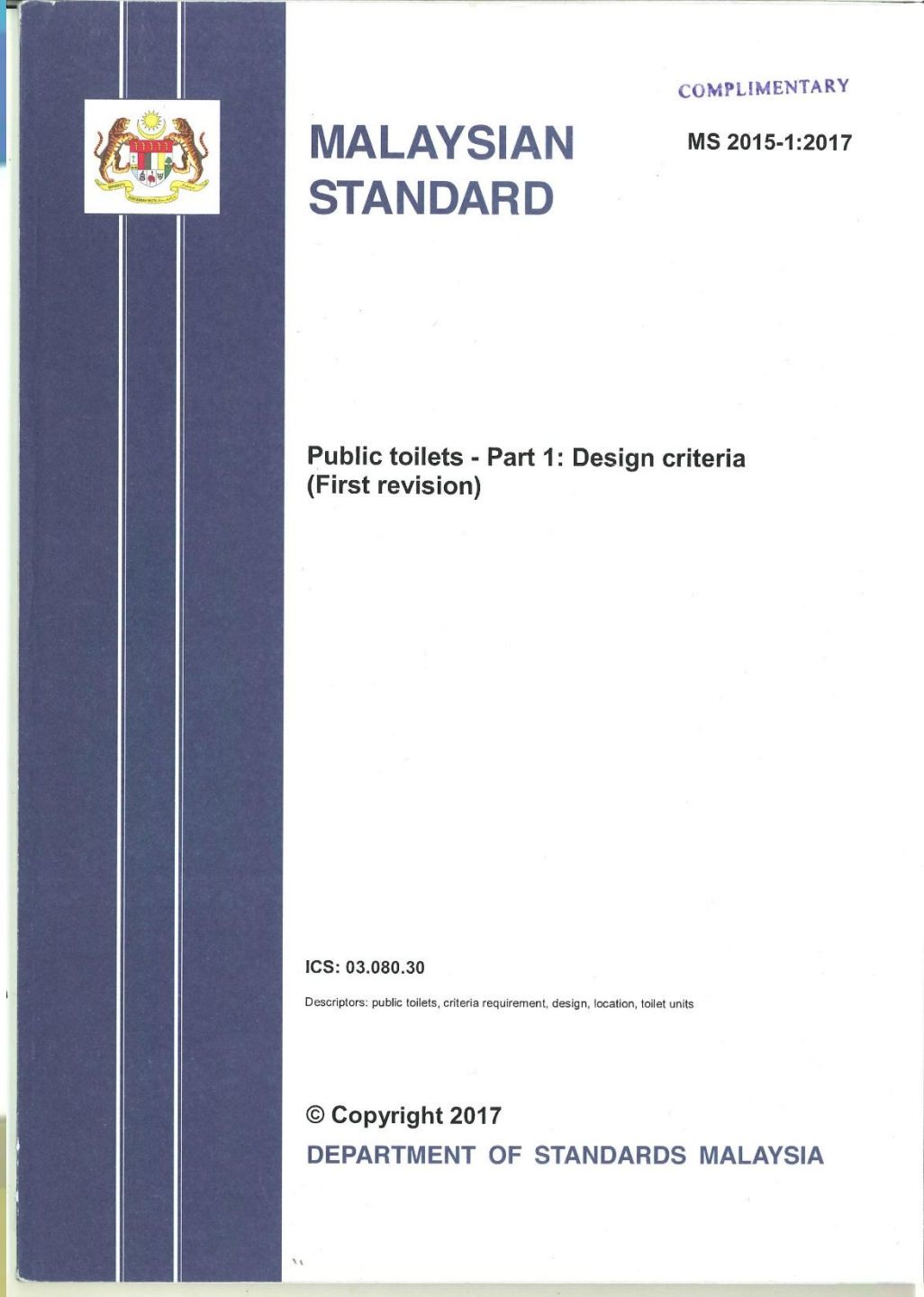
Part 4: Code of practice for maintenance (2006)

This Malaysian Standard cancels and replaces MS 2015-1:2006, Public toilets - Part 1: Minimum design criteria. Latest edited 2017

Table of Content

INTRODUCTION

- The purpose of this Malaysian Standard is to provide a guideline of clean, hygienic, user and environmental friendly, safe and convenient-to-use public health facilities of appropriate design and quality
- This Malaysian Standard provides guidance on the basic care and maintenance of the facilities in public toilets



CONTENT

Contents

CLAUSE 1: SCOPE

- This Malaysian Standard covers all the public toilets, whether found in stand-alone structures or inside buildings (used by the occupants or by visitors to the building, or both). It includes statutory requirements, design, location, number, type and quality of the public toilets.

- Guidance is given to the provision of public toilets of various categories and adequacy, wherever they may be located.

- This standard does not cover supply of water and storage systems for public toilets. Providers of public toilets will provide systems that are ecologically appropriate to the location and are of sound construction.

CLAUSE 4: PERFORMANCE REQUIREMENTS

4.1 Function

The function of public toilet is to provide facilities for the public to use in which they may urinate, defecate, clean themselves, groom, perform parenting needs (where applicable) and otherwise attend to bodily needs in a clean, secure, private and hygienic manner.

4.3 Performance

4.3.1 Public toilet facilities shall provide for the needs of people of all genders, for parents and children, for people with disabilities and their carers in all gender combinations.

4.3.2 Public toilets shall be safe, private and hygienic and should be conveniently located, structurally sound and vandal resistant.

4.4 Structure

Public toilets are either buildings or part of a building. As such they shall comply with the statutory and requirements of authorities. The performance requirements for the toilet building and sanitary fixtures within it will be the same regardless of the location.

4.5 Number

Sufficient public toilet units shall be provided:

a) to meet the requirements of the locality; and

b) to meet the requirements of the expected gender ratio.

For recommended number of toilet cubicles, see Annex D.

CLAUSE 5: DESIGN OF PUBLIC TOILETS

5.1 Guide for design brief preparation

Reference to this standard in the order listed as per Table 1 will assist provides to prepare public toilet design brief

Table 1. Design guide

Clause	Action
Clause 6: Location	- Select location.
Clause 7: Number of toilet units	- Determine the likely population; - Determine the length of stay; - Determine the arrival rate; - Determine the gender ratio; - Decide if all-gender or gender-specific toilet - Facilities are to be provided; and - Consider a provision for expansion.
Annex C: Number of toilet units	- Determine the number of toilet units required; - Determine the number of accessible toilet units; and - Determine the number of shower units and parenting required.
Clause 5: Design of public toilets and Annex E: Public toilet facilities – Examples of layouts	- Decide on the arrangement of the toilet units and if the number of units shall be varied in order to meet changing population demand.
Annex A: Design features and criteria	- Decide which features are to be provided.
Annex B: Toilet fittings and criteria	- Decide which fittings are to be provided
Annex F: Guide plans for toilet units	- Consult guide plans for layout of features and fittings in all-gender toilet units.
Annex D: Sanitary accommodation requirements	- Based on type of occupancies and area.

CLAUSE 6: LOCATION

6 Location

6.1 Provider considerations

6.1.1 Location

Providers shall consider providing toilet facilities at any location where there is an expectation that people may require the use of toilets, or where there is a public demand for toilets. In general, demand will be generated where people congregate away from their residence or workplace for a length of time greater than 1 h and where no public toilet facilities are provided as part of another building. It shall be noted that:

a) existing public toilets may not necessarily be in the most suitable location; and

b) provision of a public toilet at every location suggested could result in unnecessary cost and over provision.

CLAUSE 6: LOCATION

Toilet Facility Category

Table 2. Toilet facility category

Toilet facility category	Location	Main users	Expectation of user
A	City centre	Occupants, tourists, local commuters, local and foreign shoppers, high proportion children, elderly and Persons with Disability (PwDs)	Meet high quality of requirements by provider
B	Urban area	Occupants, tourists, local commuters, local and foreign shoppers, high proportion children, elderly and Persons with Disability (PwDs)	Meet high quality of requirements by provider
C	Tourist attraction area	Occupants, visitors, travellers, tourists, holiday makers	Meet high quality of requirements by provider
D	Rural area	Occupants, local commuters, local shoppers, low proportion children, high proportion of elderly and Persons with Disability (PwDs)	Meet high quality of requirements by provider
E	Other areas, i.e. public reserves (i.e. field) scenic viewpoints, travel routes, nature trails and tracks	Travelling workers, families and local commuters	Meet minimum quality of requirements by provider

CLAUSE 7: NUMBER OF TOILET UNITS

7.1 Approach

The approach to determine the number of toilet units required will be influenced by the presence, or otherwise, of an existing toilet at or near the chosen location. The determination of an ‘arrival rate’ in particular can be more accurately assessed if a measurement can be made on an existing toilet facility. Where this is not practicable then the provide shall utilise experience from other locations or use temporary toilet units as proposed in 7.3.1 to assess likely use requirements. Separate water closets and bathrooms with separate entrances for male and female shall be provided.

There are three approaches to determine the number of toilet units:

a) by trial;
b) by calculation; and
c) by building purpose group

CLAUSE 7: NUMBER OF TOILET UNITS

7.3 Determination of number of toilet units required

7.3.1 By trial

7.3.1.1 A pragmatic approach is to supply a location or augment the existing number of toilet units at a location with portable toilet units, adding sufficient units until the need is met and then designing the toilet facility to suit the need.

7.3.1.2 The provision of a temporary structure could be similarly used.

7.3.2 By calculation

7.3.2.1 Examples of a preliminary or approximate calculation and of more accurate calculations are given in Annex C.

7.3.2.2 In order to use a calculation method it is necessary to consider a number of factors. These factors are estimated or measured (usually by survey).

7.3.2.3 The number of toilet units that will be required at a particular location is influenced by the following factors (see Annex C):

a) the length of stay of the population in an area;

b) the population in the area;

c) the arrival rate;

d) the gender ratio; and

e) the occupancy time.

CLAUSE 7: NUMBER OF TOILET UNITS

7.3 Determination of number of toilet units required

7.3.2.4 Length of stay in an area

The number of people using public toilets is influenced by the length of time spent in a location. Three types of stay are identified in this standard.

a) Short term (less than 1 hour stay)

Typically town public convenience, R&R (Rest and Relaxation or '*Rehat dan Rawat*') or scenic stop areas, these are points where the travelling public may stop solely to use the toilet (up to 15 min) or to use the toilet and view the scene (30 min-60 min).

b) Medium term (1 to 2-hour stay)

Typically, people go to and remain in an area for 1 to 2 hours, for example at scenic areas, a visit to city shopping areas, at places of worship and at transportation terminals.

c) Long term (greater than 2-hour stay)

Typically people go to and remain in an area for greater than 2 hours, for example educational institutions, offices, a day at a beach, amusement/entertainment facilities, recreational parks, a camping area or picnic/barbecue site.

CLAUSE 7: NUMBER OF TOILET UNITS

7.4 Accessible toilet units

7.4.1 Accessible toilet units shall be provided in sufficient numbers but not fewer than shown in Table 3.

7.4.2 At least one accessible toilet unit shall be all-gender.

Table 3. Number of accessible toilet units required

Total toilet units	Accessible toilet units
1 to 10	1
11 to 20	2
21 to 30	3

7.5 Parenting units and shower units

Parenting and shower units shall be provided in sufficient number to meet expected demand but not fewer than shown in Table 4. Shower units are generally required at transportation terminals, recreational areas, parks and factories.

Table 4. Number of parenting and shower units required

Total toilet units	Parenting	Shower
1 to 10	Optional	To meet expected demand such as at haulage carrier stops, recreational area and factories.
11 to 20	1 or more	
21 to 30	2 or more	

NOTES:

1. At least one parenting unit shall be all-gender.

2. The provision of accessible toilet units, parenting units and shower units may be individually or combination of units to suit design requirements.

Annex A
(normative)

Design features and criteria

A.1 Toilet facility features

This annex provides a list of toilet facility features (see Table A.1) and describes by use of notes the features that shall be provided in toilet facilities of various types such as those illustrated in Annex E.

A.2 Application

This annex provides information on features that are mandatory, with respect of this standard, desirable, or optional for the various types of toilet facility A to C described in Annex E. Where items are desirable or optional, their inclusion is the responsibility of the provider. Such items are included here for information. Additional features may be provided.

Table A.1. Design features for toilet facilities

	Feature	Refer Note	Toilet type				
			A	B	C	D	E
1.	Clear and adequate signage (directional and gender)	1	MA	MA	MA	MA	MA
2.	Entrance of public place	2	MA	MA	MA	MA	MA
3.	Entrances to gender specific	3	MA	MA	MA	MA	OP
4.	Unit fully enclosed	4	MA	MA	MA	MA	MA
5.	Unit self-contained	5	MA	MA	MA	MA	MA
6.	Accessible unit	6	MA	MA	MA	MA	MA
7.	Cleaning facilities	7	MA	MA	MA	MA	MA
8.	Attendant facilities	8	MA	MA	MA	MA	MA
9.	Quality external appearance	9	MA	MA	MA	MA	OP
10.	Pleasant interior ambience	10	MA	MA	MA	MA	OP
11.	Illumination	11	MA	MA	MA	MA	MA
12.	Ventilation	12	MA	MA	MA	MA	MA
13.	Washable fittings	13	MA	MA	MA	MA	MA
14.	Washable surfaces	14	MA	MA	MA	MA	MA
15.	Soil/waste to septic tank/public sewer	15	MA	MA	MA	MA	MA
16.	Consistent water supply	16	MA	MA	MA	MA	MA
17.	Floor drainage	17	MA	MA	MA	MA	MA
18.	Vandal resistance	18	MA	MA	MA	MA	MA
19.	Parenting unit	19	MA	MA	MA	OP	OP
20.	Shower unit	20	OP	OP	OP	OP	OP
21.	Ablution	21	OP	OP	OP	OP	OP

MA : Mandatory

OP : Optional

Annex B
(normative)

Toilet fittings and criteria

B.1 General

This annex provides a list of toilet facility fittings (see Table B.1) and describes via notes the features that shall be provided in toilet facilities of various types such as those illustrated in Annex E.

B.2 Application

B.2.1 This annex provides information on features that are mandatory (to comply with this standard) or optional for the various types of toilet facility A to E described in Annex E. Where items are optional, their inclusion is the responsibility of the provider except in the case of requirements for accessible units.

B.2.2 Standards

All sanitary wares, fittings and accessories shall, whenever possible, comply with all relevant Malaysian Standards.

Table B.1. Toilet fittings

Fittings		Refer Note	Toilet facility				
			A	B	C	D	E
1.	Water closet with seat	1	MA	MA	MA	MA	MA
2.	Squatting water closet	2	OP	OP	OP	OP	OP
3.	Toilet paper dispenser	3	MA	MA	OP	OP	OP
4.	Children water closet	4	OP	OP	OP	OP	OP
5.	Sanitary disposal unit	5	MA	MA	MA	OP	OP
6.	Flushing cistern within unit	6	MA	MA	MA	MA	MA
7.	Flushing cistern outside unit	7	MA	MA	MA	OP	OP
8.	Concealed flush valve	8	OP	OP	OP	OP	OP
9.	Urinal with water supply	9	MA	MA	MA	MA	MA
10.	Manual urinal flushing	10	MA	MA	MA	MA	MA
11.	Automatic urinal flushing	11	OP	OP	OP	OP	OP
12.	Hand bidet, built in bidet and through the wall bidet	12	OP	OP	OP	OP	OP
13.	Wash basin	13	MA	MA	MA	MA	MA
14.	Self-closing taps to basin	14	OP	OP	OP	OP	OP
15.	Sensor tap to basin	15	OP	OP	OP	OP	OP
16.	Soap dispenser	16	MA	MA	MA	OP	OP
17.	Hand drying facilities	17	MA	MA	MA	OP	OP

MA : Mandatory

OP : Optional

Fittings		Refer Note	Toilet facility				
			A	B	C	D	E
18.	Paper drying towels	18	MA	MA	MA	OP	OP
19.	Hand dryer	19	MA	MA	MA	OP	OP
20.	Mirror	20	MA	MA	MA	MA	MA
21.	Mirror for accessible toilet	21	MA	MA	MA	MA	MA
22.	Coat/bag hooks	22	MA	MA	MA	MA	MA
23.	Child restraint seat	23	OP	OP	OP	OP	OP
24.	Shelf	24	OP	OP	OP	OP	OP
25.	Rubbish container	25	MA	MA	MA	MA	MA
26.	Grab rails	26	OP	OP	OP	OP	OP
27.	Door locking device	27	MA	MA	MA	MA	MA
28.	Door closer device	28	OP	OP	OP	OP	OP
29.	Use indicator	29	MA	MA	MA	MA	MA
30.	Rescue indicator	30	MA	MA	MA	MA	MA
31.	Full access standard fittings	31	MA	MA	MA	MA	MA
32.	Symbol signage	32	MA	MA	MA	MA	MA
33.	Baby changing table	33	MA	MA	MA	OP	OP
34.	Nappy disposal unit	34	MA	MA	MA	OP	OP
35.	Nursing seat	35	OP	OP	OP	OP	OP

MA : Mandatory

OP : Optional

36.	Drinking fountain	36	OP	OP	OP	OP	OP
37.	Shower base/drainage	37	MA	MA	MA	MA	MA
38.	Shower touch tap(s)	38	OP	OP	OP	OP	OP
39.	Shower no-touch tap(s)	39	OP	OP	OP	OP	OP
40.	Adjustable shower head/hose unit	40	OP	OP	OP	OP	OP
41.	Shower water supply cold/hot	41	OP	OP	OP	OP	OP
42.	Shower water supply premixed	42	OP	OP	OP	OP	OP
43.	Shower seat	43	OP	OP	OP	OP	OP
44.	Shower enclosure	44	OP	OP	OP	OP	OP
45.	Cleaning sink/trough with water supply (for maintenance only)	45	OP	OP	OP	OP	OP
46.	Storage for cleaning equipment	46	MA	MA	MA	OP	OP
47.	Toilet accessory sales	47	MA	MA	MA	OP	OP
48.	Air deodoriser	48	OP	OP	OP	OP	OP
49.	Ablution	49	OP	OP	OP	OP	OP
50.	Floor traps	50	MA	MA	MA	MA	MA
51.	Counter/Vanity tops	51	MA	MA	MA	OP	OP
52.	Basin traps	52	MA	MA	MA	MA	MA
53.	Toilet floor mat	53	OP	OP	OP	OP	OP

MA : Mandatory

OP : Optional

Annex C
(informative)

Number of toilet units - Examples of calculations

1. General
2. Factors that affect numbers of toilet units
3. Types of facility
   - All-gender facilities
   - Gender-specific facilities
   - Urinals
4. Calculations
5. Accuracy

C.1 General

This annex gives background information and examples of calculating the numbers of toilet units required at a particular location.

C.2 Factors that affect numbers of toilet units

C.2.1 General

The following main factors used in this annex have been identified in Clause 5:

a) the length of stay of the population in an area;

b) the population in the area;

c) the arrival rate;

d) the gender ratio; and

e) the occupancy time.

NOTE. The variability of locations for toilet facilities guidance, on determining the number of toilet units needed at any one place can best be given by providing information and examples for the provider/designer to use.

Table C.3. Design occupancy times

Situation	Gender	Design occupancy time (s) [a, b]	
		Total = Use time + hand basin time	
No 'interval effect'	Female	150	(90 + 60)
	Male	100	(60 + 40)
Limited opportunity to use toilet - the 'interval effect'	Female	130	(70 + 60)
	Male	90	(50 + 40)

NOTE:

Where there was a limited opportunity to use the toilet (the interval effect), e.g. at a theatre, stadium, swimming pool, then the average design occupancy time is less than in other situations. This is due to a greater proportion of the population using the toilet solely for urination.

[a] The figures are based on the longer occupancy times recorded in the survey and are therefore relatively conservative.

[b] The male occupancy time is the estimated average of water closet pan to urinal use of 1:6.

C.3 Types of facility

C.3.1 All-gender facilities

C.3.1.1 All-gender facilities require the provision of a water closet pan and a basin as a minimum within the unit.

The design occupancy times used for calculating the numbers of all-gender toilet units therefore include the use of the hand basin (see Table C.3.).

C.3.1.2 Since occupancy times differ for males and females, the design occupancy time should take into account gender ratios.

C.3.2 Gender-specific facilities

For gender-specific toilet facilities, using all-gender toilet units the design occupancy time will be the same as in C.3.1.

C.3.3 Urinals

C.3.3.1 Urinals have the advantage of being able to service a high arrival rate and a larger number of people due to the low occupancy times. A decision to install urinals should be governed by the gender ratio of the population in the area, and consideration of the privacy of the urinal users. The mean occupancy time for urinal usage is given in Table C.2.

C.4.1 Calculations example

C.4.1.1 Preliminary estimate

The calculation example below will provide an initial estimate of the required number of all-gender toilet units. However the calculation:

a) does not take into account gender ratio of the population; and

b) assumes a conservative occupancy time of 3 min (180 s).

For gender-specific toilet facilities, the number of toilet units needs to be calculated as in C.4.1.2, which takes into account the gender ratio.

EXAMPLE: A 50 seat bus stopping for up to 30 min with the next stop being an hour or so later. 80 % of the passengers wish to use the toilet facilities (this situation provides 40 users in 30 min.)

$$\text{No. of toilet units} = \frac{\text{Population x peak arrival rate x toilet occupancy time}}{\text{Time of stay in area}}$$

$$= \frac{(50 \times 0.8) \times 3}{30}$$

$$= 4 \text{ units}$$

C.4.1.2 Detailed calculations

Calculations using the formula below take into account the gender ratio of the population using the toilet facility.

The formula is:

$$N = P \times A \times G \times O$$

where

N is the number of toilet units required;

P is the peak population per minute;

A is the peak arrival rate;

G is the gender ratio; and

O is the occupancy time in minutes.

C.4.1.2.1 Short-term stay

Observed data

Five buses each with 50 seats arrive at a location in 30 min. 80 % of passengers wish to use a toilet unit. Buses carry on average up to 80 % females and up to 60 % males.

Calculation

From the data the basic factors are:

Population = 250 people in 30 min;

Arrival rate = 80 %; and

Gender ratio = up to 80 % female, up to 60 % male.

There is limited opportunity to use facilities (30 min) and the appropriate section of Table C.3 applies.

a) All-gender toilet facility requirements

The toilet unit occupancy time (Table C.3) is 130 s for female and 90 s for male users. It includes an allowance for hand basin usage.

i) Gender ratio 80:20

$$\text{Female: } \frac{250}{30} \times 0.8 \times 0.8 \times \frac{130}{60} = 11.6 \text{ units}$$

$$\text{Male: } \frac{250}{30} \times 0.8 \times 0.2 \times \frac{90}{60} = 2 \text{ units}$$

Total = 13.6 units

ii) Gender ratio 40:60

$$\text{Female: } \frac{250}{30} \times 0.8 \times 0.4 \times \frac{130}{60} = 5.8 \text{ units}$$

$$\text{Male: } \frac{250}{30} \times 0.8 \times 0.6 \times \frac{90}{60} = 6 \text{ units}$$

Total = 11.8 units

An all-gender toilet facility would require at least 13.6, i.e. 14 units.

b) Gender-specific toilet facility requirements

From Table C.3 the toilet unit occupancy time is the same as in a) above and the calculation applies. It includes an allowance for hand basin usage within the self-contained cubicle.

The calculation shows that a gender-specific toilet facility requires 11.6, i.e. 12 units for females and 6 units for males in order to cope with the expected gender ratios, i.e. a total of 18 units are required.

C.4.1.2.2 Medium- and long-term stay

Observed data

Peak population at a beach is 1 000 with an assumed 60/60 gender ratio and assumed arrival rate of 10 %.

Calculation

From the data the basic factors are:

Population = 1 000 people in 60 min;

Arrival rate = 10 %; and

Gender ratio = 60 % female, 60 % male.

The situation in Table C.3 applies.

a) All-gender toilet facility requirements

The toilet unit occupancy time (Table C.3) is 150 s for female and 100 s for male users. It includes an allowance for hand basin usage.

i) Gender ratio 60:40

$$\text{Female: } \frac{1\,000}{60} \times 0.1 \times 0.6 \times \frac{150}{60} = 2.5 \text{ units}$$

$$\text{Male: } \frac{1\,000}{60} \times 0.1 \times 0.4 \times \frac{100}{60} = 1.1 \text{ units}$$

Total = 3.6 units

ii) Gender ratio 40:60

$$\text{Female: } \frac{1\,000}{60} \times 0.1 \times 0.4 \times \frac{150}{60} = 1.7 \text{ units}$$

$$\text{Male: } \frac{1\,000}{60} \times 0.1 \times 0.6 \times \frac{100}{60} = 1.7 \text{ units}$$

Total = 3.4 units

An all-gender toilet facility would require at least 3.4, i.e. 4 units.

b) Gender-specific toilet facility requirements

From Table C.3 the toilet unit occupancy time is the same as in a) above and the calculation applies. It includes an allowance for hand basin usage within the self-contained cubicles.

The calculation shows that a gender-specific toilet facility requires 3 units for females and 1.7, i.e. 2 toilet units for males in order to cope with the expected gender ratios, i.e. a total of 5 units are required.

Annex D
(normative)

Number of sanitary facilities

1. Sanitary facilities

W.C = Water Closet
Wb = Water barrier
Ur = Urinal

Table D.1. Number of sanitary facilities

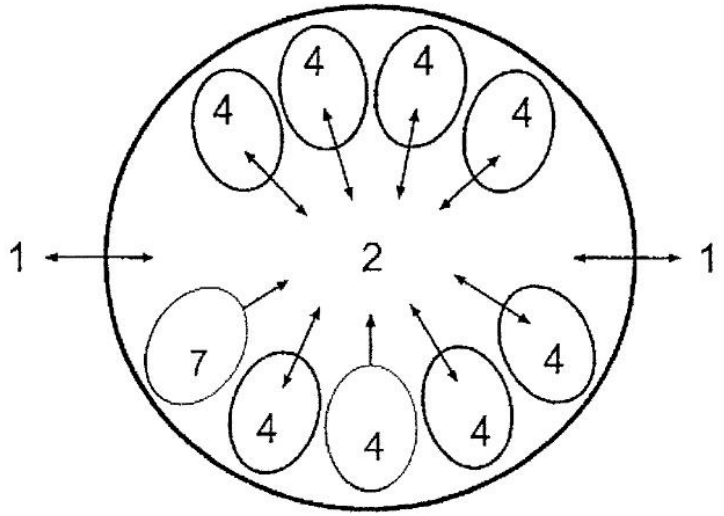
Description	Staff					Public				
	Female		Male			Female		Male		
	W.C.	Wb	W.C.	Ur	Wb	W.C.	Wb	W.C.	Ur	Wb
1) Office (each floor)										
Not more than 500 m^2	1	1	1	2	1	-	-	-	-	-
501 m^2 to 1 000 m^2	2	1	2	4	2	-	-	-	-	-
1 001 m^2 to 2 000 m^2	3	2	3	5	3	-	-	-	-	-
Every additional 1 000 m^2 or less in excess of 1 000 m^2	1	1	1	1	1	-	-	-	-	-
2) Shopping places (each floor)										
Not more than 250 m^2	-	-	-	-	-	1[a]	1[a]	-	1	-
501 m^2 to 1 000 m^2	-	-	-	-	-	2	1	1	2	1
1 000 m^2 to 2 000 m^2	2	1	1	2	1	1	1	1	2	1
2 001 m^2 to 3 000 m^2	3	2	2	3	2	2	1	1	2	2
Every additional 1 000 m^2	4	3	3	4	3	3	2	2	4	3
or less in excess of 3 000 m^2	1	1	1	1	1	-	-	-	-	-
3) Eating establishments including bars and nightclubs (each floor)										
Not more than 150 m^2	-	-	-	-	-	-	1[a]	1[a]	-	1
151 m^2 to 250 m^2	-	-	-	-	-	1	1	1	2	1
251 m^2 to 500 m^2	1	1	1	1	1	1	1	1	2	1
501 m^2 to 750 m^2	2	1	1	1	1	2	1	1	2	1
751 m^2 to 1 000 m^2	2	1	1	2	1	2	1	2	3	2
1 001 m^2 to 1 500 m^2	3	2	2	3	2	4	2	2	4	2
1 501 m^2 to 2 000 m^2	3	2	2	4	3	5	3	3	5	3
Every additional 1 000 m^2 or less excess of 2 000 m^2	-	-	-	-	-	1	1	1	2	1
4) Conference halls, clubs, assemblies: Based on seating capacity as follows:										
Not more than 150 persons	-	-	-	-	-	1	1	1	2	1
150 persons to 300 persons	-	-	-	-	-	2	2	2	3	2
301 persons to 450 persons	-	-	-	-	-	3	2	2	5	3
451 persons to 600 persons	-	-	-	-	-	4	2	3	5	4
601 persons to 900 persons	-	-	-	-	-	5	3	4	7	5
Every additional 300 persons or less in excess of 900 persons	-	-	-	-	-	1	1	1	2	1
5) Places of worship:										
a) for every 200 males or less										
b) for every 100 females or less	-	-	-	-	1	1	1	2	1	-
6) Parks, tourist sites, public resort piers	-	-	-	-	-	2	2	2	2	2

Annex E
(informative)

Public toilet facilities - Examples of layouts

1. General
2. Toilet Facility A
3. Toilet Facility B
4. Toilet Facility C
5. Toilet Facility D
6. Toilet Facility E

Example of layout for toilet facility A

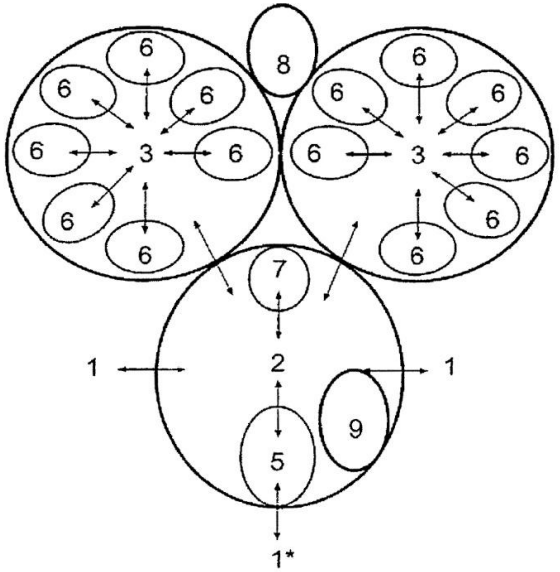


Key

1 Entrance (off public place)
2 Main toilet area
4 Toilet unit (gender specific)
7 Attendant (janitor/storage)

Figure E.1. Gender-specific - Attended

Example of layout for toilet facility B



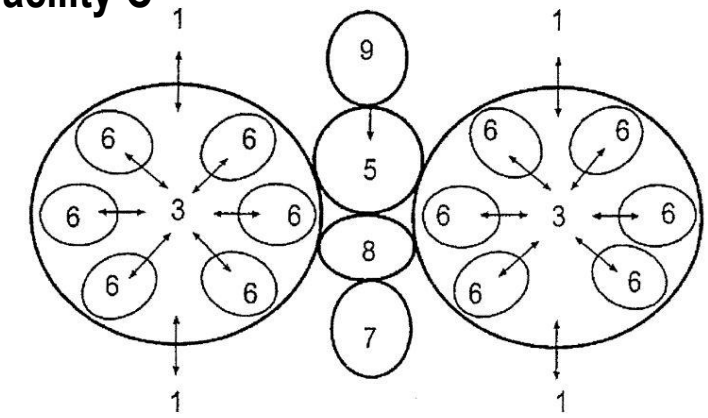
Key

1 Entrance (off public place)
2 Foyer (all-gender)
3 Foyer (gender-specific)
5 Toilet unit (all-gender, accessible)
6 Toilet unit (gender-specific, may be accessible)
7 Attendant (sales/cleaning)
8 Cleaning (storage)
9 Parenting

* Entrance to toilet unit 5 may be from foyer 2 or from a public place.

Figure E.2. Gender-specific with all-gender foyer and all-gender accessible unit Attended

Example of layout for toilet facility C

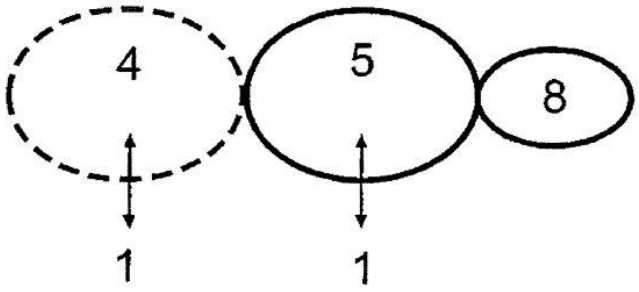


Key

1 Entrance (off public place)
3 Foyer (gender-specific)
5 Toilet unit (all-gender, accessible)
6 Toilet unit (gender-specific, one may be accessible)
7 Attendant (janitor/cleaning)
8 Cleaning (storage)
9 Parenting

Figure E.3. Gender-specific with all-gender accessible unit - Attended

Example of layout for toilet facility D

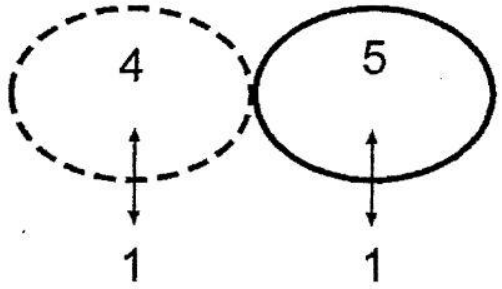


Key

1 Entrance (off public place)
4 Additional toilet units (all-gender or gender-specific)
5 Toilet unit (all-gender, accessible)
8 Cleaning

Figure E.4. All-gender or gender-specific - Unattended

Example of layout for toilet facility E



Key

1 Entrance (off public place)
4 Additional toilet units (may be accessible, all-gender or gender-specific)
5 Toilet unit (all-gender, accessible)

Figure E.5. All-gender or gender-specific - Unattended

Annex F
(informative)

Guide plans for toilet units

1. Guide plans
2. Application
3. Plans and elevations

F.2.2 Types of toilet units

F.2.2.1 The plans and elevations cover the following types of toilet units:

Table F.1. Types of toilet units

Type	Options
Figure F.1. Typical squatting W.C. - Cubicle with grab bar	Inward-opening doors
Figure F.2. Typical squatting W.C. - Cubicle with half brickwall and half partition with grab bar	Inward-opening doors
Figure F.3. Typical pedestal W.C. - Cubicle with grab bar	Inward-opening doors
Figure F.4. Typical pedestal W.C. - Cubicle half brickwall and half partition with grab bar	Inward opening doors
Figure F.5. Adult and children urinal (exposed flush system)	Inward-opening doors
Figure F.6. Adult and children urinal (exposed flush system)	Inward-opening doors
Figure F.7. Adult and children urinal (concealed flush system)	Inward-opening doors
Figure F.8. Adult and children urinal (concealed flush system)	Inward-opening doors
Figure F.9. Typical wash basin (under counter) with seamless counter top for adult and children	-
Figure F.10. Typical wash basin (under counter) with seamless counter top for adult and children	-
Figure F.11. Typical wash basin (under counter) with seamless counter top for adult and children	-
Figure F.12. Accessible toilet unit with toilet pan at side	Inward-opening doors
Figure F.13. Accessible toilet unit with with large corner	Inward-opening doors
Figure F.14. Toilet facility A	Inward-opening doors
Figure F.15. Toilet facility B	Inward opening doors
Figure F.16. Toilet facility C	Inward-opening doors
Figure F.17. Toilet facility D	Inward-opening doors
Figure F.18. Toilet facility E	Inward-opening doors

The examples are not exhaustive but are guides to other combinations of features and fittings to suit other needs.

Table F.2. Definitions of abbreviations

Abbreviations	Definition
BCS	Baby changing station
CE	Cistern enclosure (top as shelf)
RH	Robe hook
CRS	Child restraint seat
DS	Door stop
FB	Flush button
THB	Tap with hand bidet
GR	Grab rail
FG	Foldable grab rail
H	Door handle
HD	Hand drier
KP	Kick plate
M	Mirror
NDU	Nappy disposal unit
NS	Nursing seat
RDU	Rubbish disposal unit
S	Shelf
SB	Toilet seat flap support/buffer
SD	Soap dispenser
SDU	Sanitary disposal unit
SS	Shower seat (fold up type)
TRH	Toilet roll holder
WB	Water barrier
WC	Toilet pan
WHB	Wash hand basin
UR	Urinal (wall hung)

Dimensions in millimetres

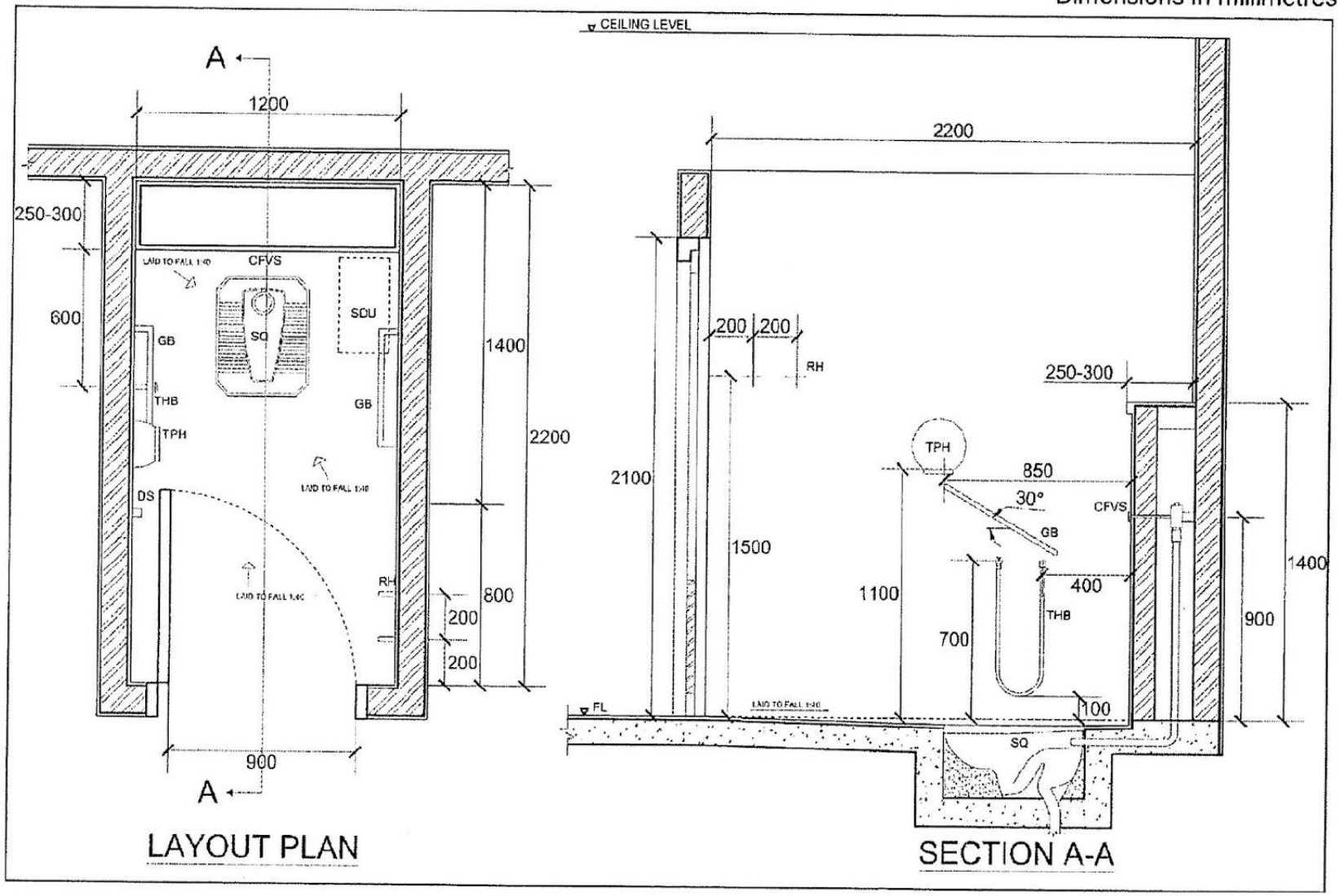


Figure F.1. Typical squatting W.C. - Cubicle with grab bar

Dimensions in millimetres

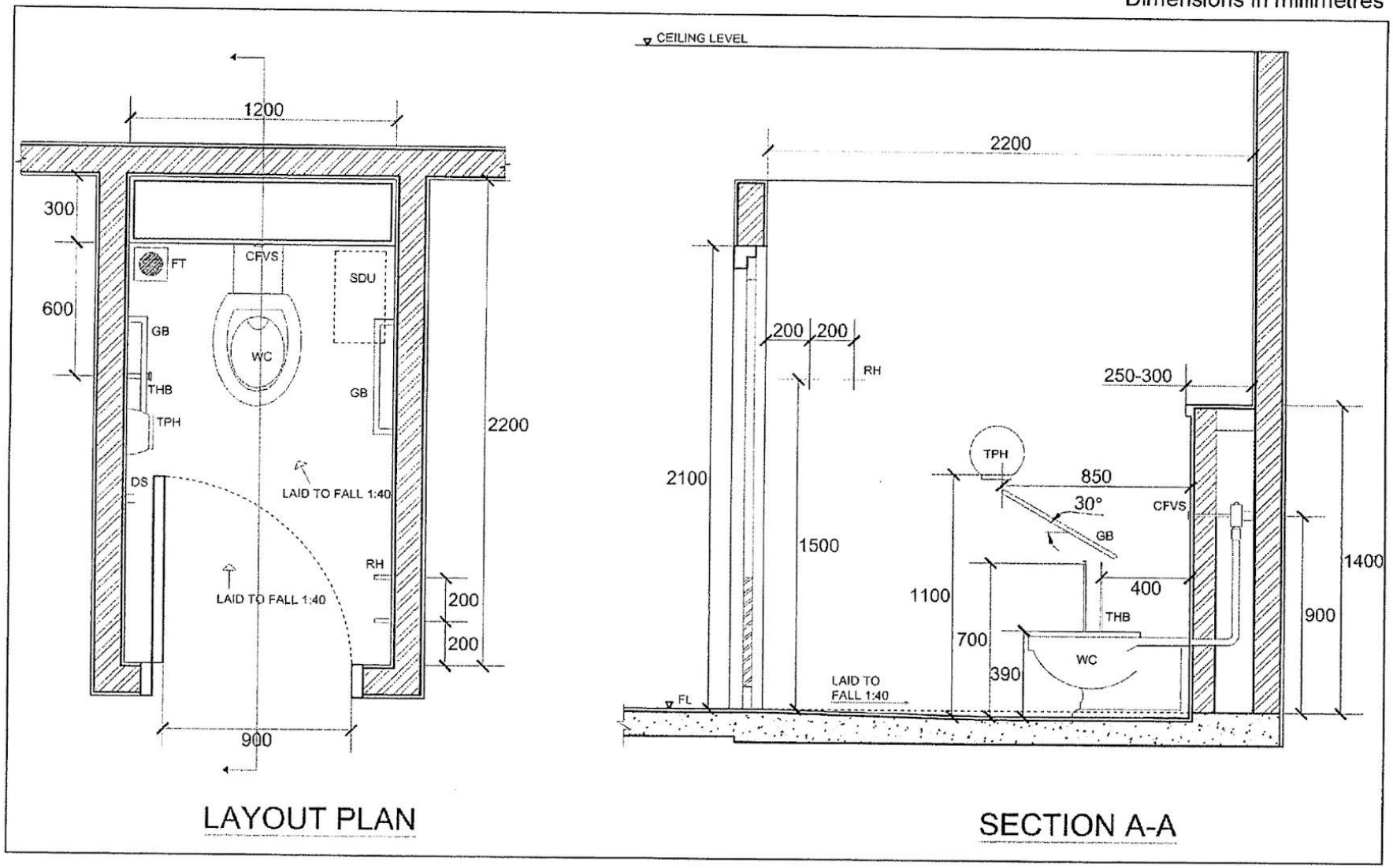


Figure F.3. Typical pedestal W.C. - Cubicle with grab bar

Dimensions in millimetres

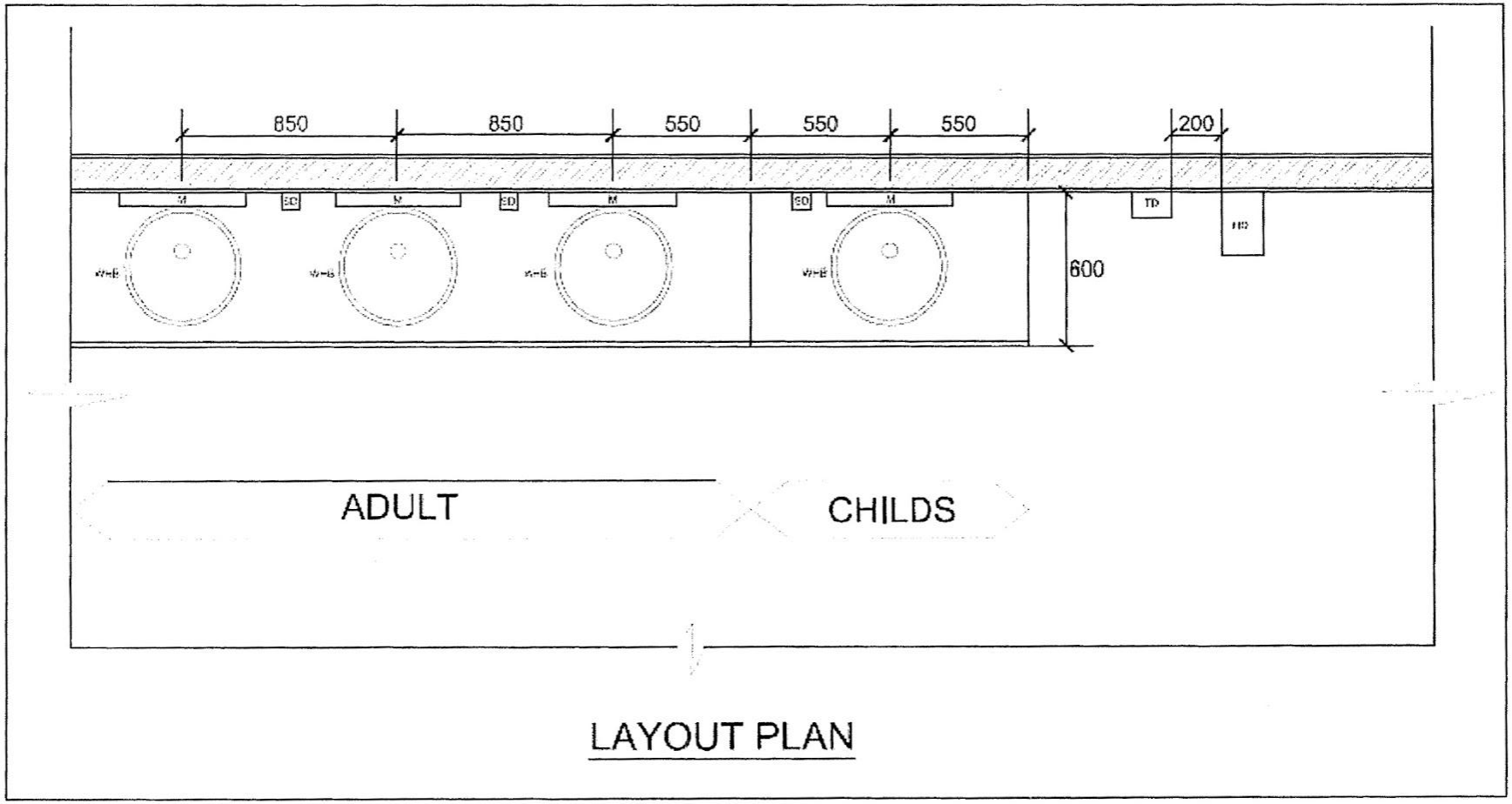


Figure F.9. Typical wash basin (under counter) with seamless counter top for adult and children

Dimensions in millimetres

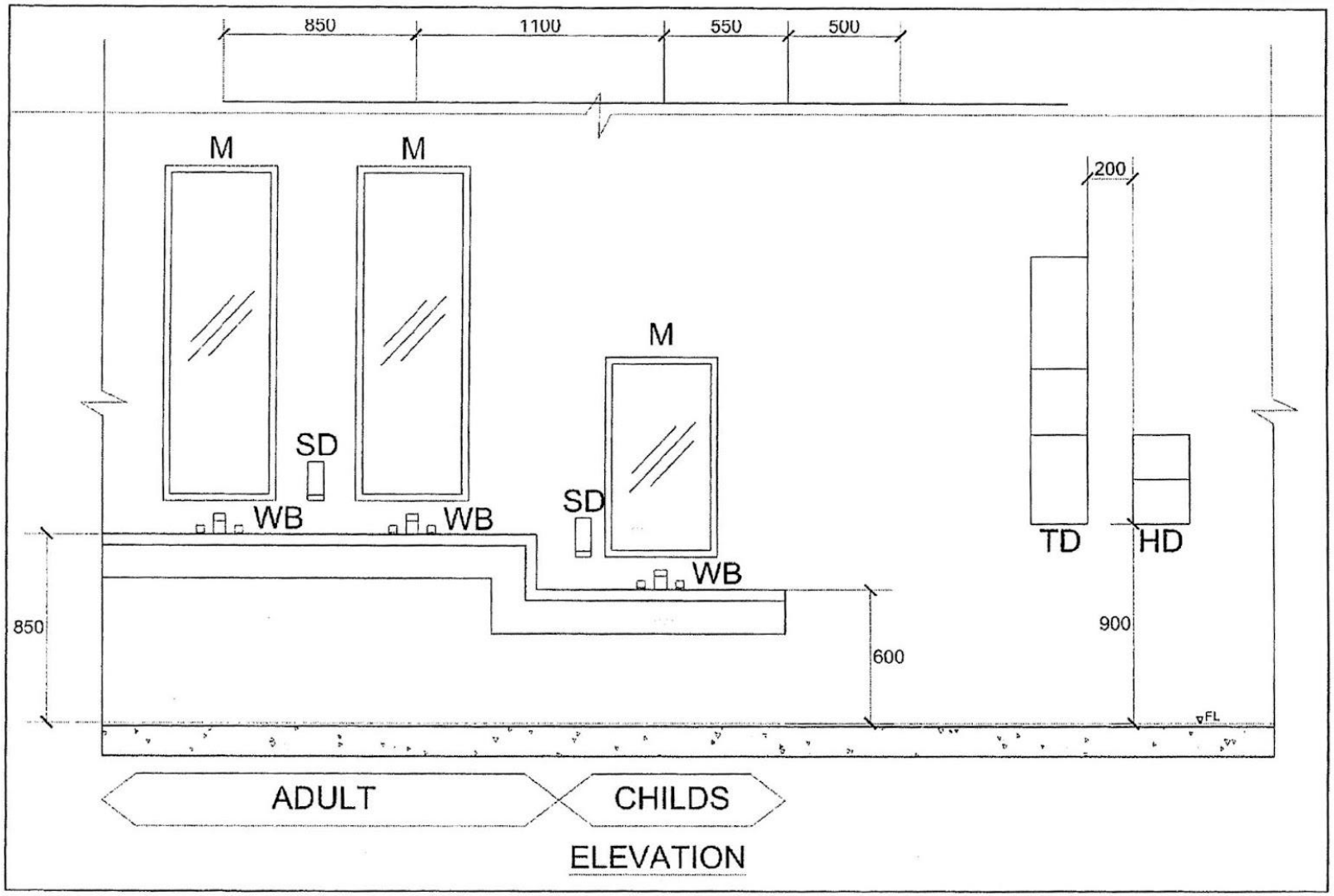


Figure F.11. Typical wash basin (under counter) with seamless counter top for adult and children

Dimensions in millimetres

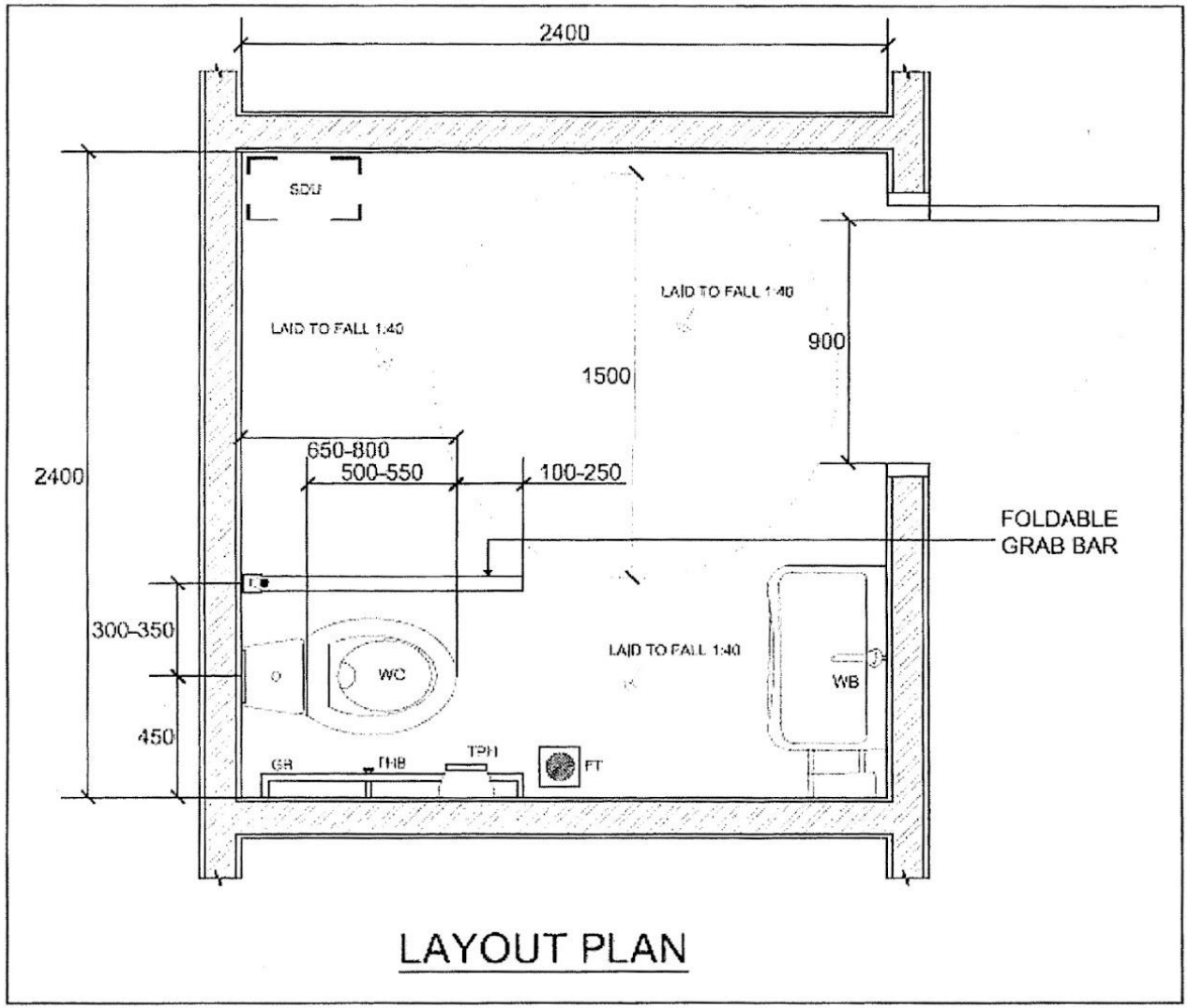


Figure F.12. Accessible toilet unit with toilet pan at side

Dimensions in millimetres

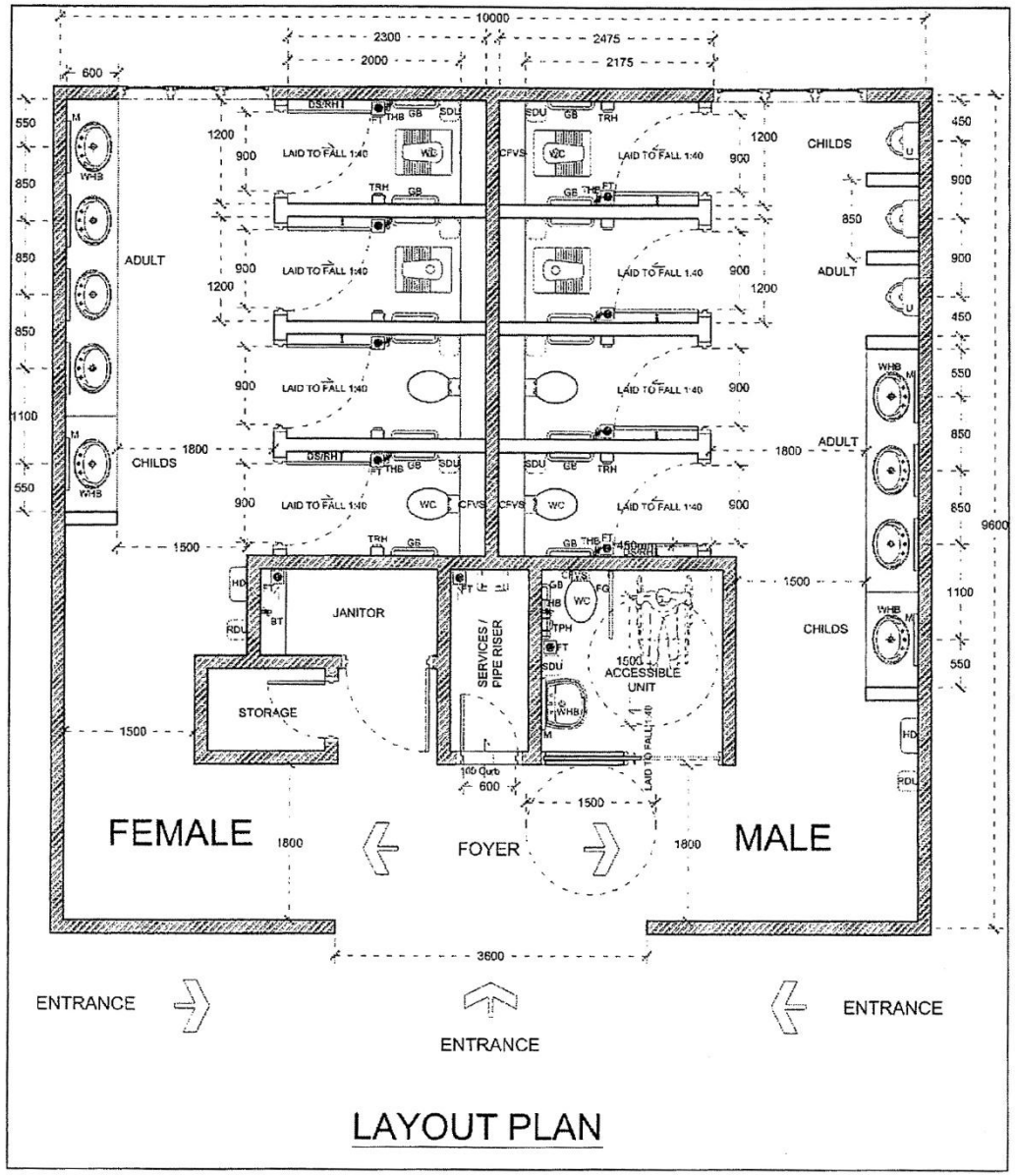


Figure F.14. Toilet facility A

Dimensions in millimetres

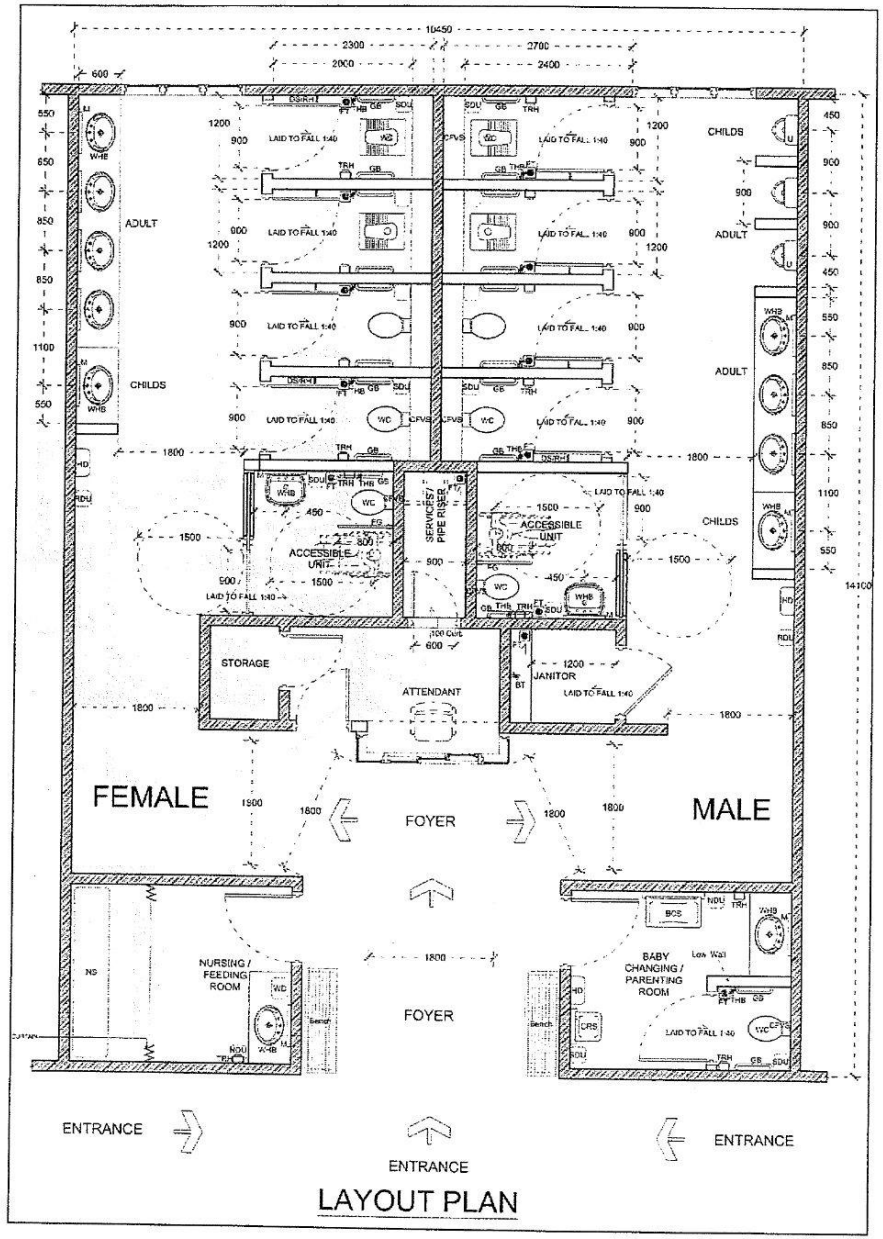


Figure F.15. Toilet facility B

Dimensions in millimetres

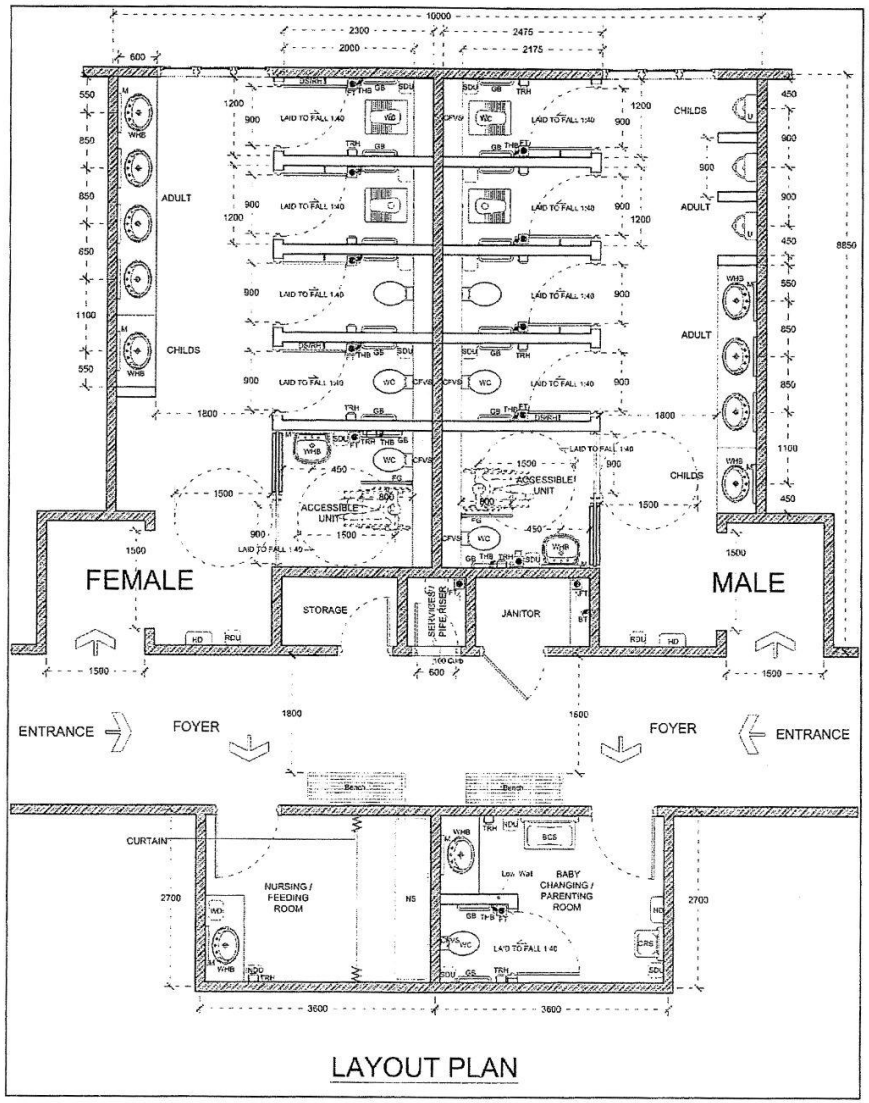


Figure F.16. Toilet facility C

Dimensions in millimetres

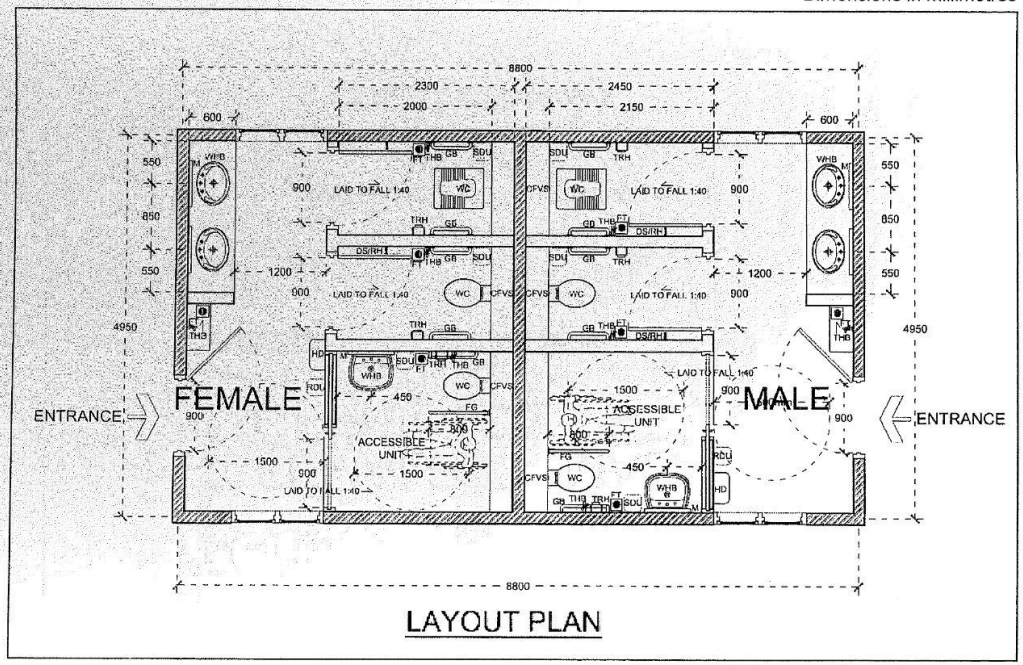


Figure F.17. Toilet facility D

Dimensions in millimetres

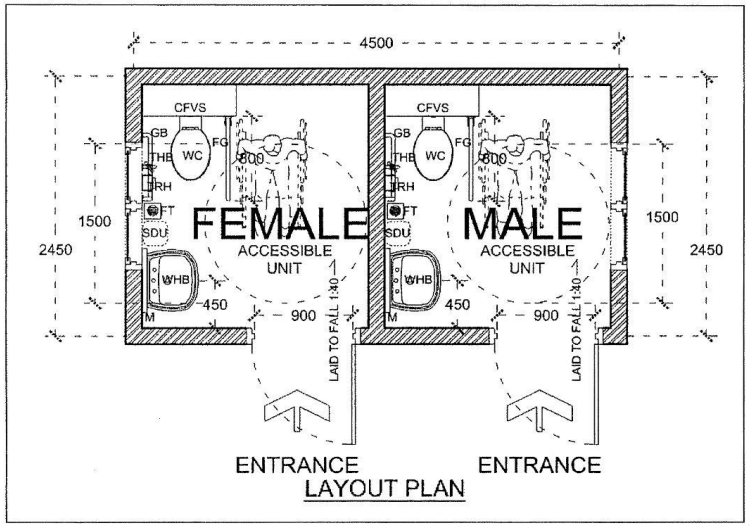


Figure F.18. Toilet facility E

PART 2: INSPECTION CRITERIA

MALAYSIAN STANDARD

MS 2015: PART 2:2006

PUBLIC TOILETS –
PART 2: INSPECTION CRITERIA

ICS: 03.080.30

Descriptors: duties, responsibilities, daily checking system, inspection, checklist, cleaning, reporting damage, cleaning method sheets

DEPARTMENT OF STANDARDS MALAYSIA

CONTENTS

PART 2: INSPECTION CRITERIA

Scope, purpose and field of application

This Malaysian Standard specifies the two types of inspection methods for public toilets which are inspection and daily checking system (DCS). These two methods of assessment apply to the design, cleanliness and facilities of public toilets. The purpose of this assessment is to specify a measuring system that determines the quality of design, facilities and cleanliness to objective conditions. The final inspections can be used as a tool to compare the obtained quality with the prescribed quality.

The principal of the inspection and daily checking system are based on visual and physical assessment on the degree of absence of disorder in a sample of selected elements of the object (public toilets) to be inspected.

This standard applies to the measurement of the quality of design facilities and cleanliness in all types of public toilets. Elements can be inspected and checked objectively by comparing their state with the prescribed result as normatively defines in the inspection criteria and daily checking system criteria

PART 2: INSPECTION CRITERIA

Scope, purpose and field of application

The daily checking system (DCS) is developed to safeguard the quality of cleaning result. It is quick and simple sample inspection, which can be carried out by a supervision team on-site. The sample checks are in principle done on daily basis and sample selection is guided by the insight and uses the Acceptance Limit Level (ALL) for cleaning related defect at toilet (see Annex E)

This standard applies to any party who operates the cleaning of public toilets where the building owner or client shall enforce the implementations and applications of this standard in the proper manner.

Annex A
(normative)

Instructions for inspection

Since the assessment of the cleaning quality is carried out by people and is based on visual inspection, a difference of opinion is possible regarding the standard (i.e. quality) of the cleaning.

A number of rules are given in this annex, aiming at a reasonable and unanimous assessment of the cleaning quality.

Detailed instructions for inspection are specified hereafter for the various elements. For each element the most common faults are described together with instructions for rejection or acceptance, especially if the inspection is not carried out immediately following the cleaning, thus creating the possibility for repollution, the following instructions shall be respected. This list is meant to be indicative; the agreed cleaning programme determines the elements to be inspected.

1. Inspection where possibility of pollution exists
2. Inspection immediately after cleaning without possibility of pollution

Annex B
(normative)

Inventory of elements and inspection units

B1. Inventory in general

There are two aspects to the inventory:

a) inventory of inspection unit; and

b) inventory of elements.

When referred to as 100 % inventory, or a complete inventory, it means that:

a) all inspection units are counted and registered per individual area; and

b) all elements are counted without registering the number of elements per individual area.

If a complete inventory is not taken, this may mean that by use of a sample the elements are counted, or that by use of a sample, the inspection units are counted, or a combination of both.

Within this standard four combinations are used:

Method A : complete inventory on inspection units and complete inventory on elements;

Method B : completes inventory on inspection units and a random-sample inventory on elements;

Method C : inventory on inspection units and on elements by the use of a select sample; and

Method D : inventory on inspection units and on elements by the use of a random sample.

Method A, is always applicable but shall be used on small clusters, and in case of doubt.

Method B, C and D can only be used on large clusters of areas.

Method B, is recommended for large clusters of high movement of traffic areas and sanitary areas.

Method C, is recommended for large clusters of sanitary areas.

Method D is recommended for large clusters of sanitary areas with nappy change areas, disables sanitary areas and other areas. For these categories also, methods A and B are applicable, but as a rule, if cluster size allows it, method D is favoured.

Since method D does not register the number of inspection units per individual area, this method has the additional advantage that fluctuations in density of occupation are corrected within the system.

Annex C
(normative)

Samples sizes table

Table C1. Sample size

Inspection units	Reduced	Normal	Tightened
2 - 5	2	2	2
6 - 8	2	2	3
9 - 11	2	3	4
12 - 15	3	3	5
16 - 18	3	4	6
19 - 21	4	4	7
22 - 25	5	5	8
26 - 30	5	5	9
31 - 35	5	6	10
36 - 40	5	7	11
41 - 45	6	7	12
46 - 50	6	8	13
51 - 55	6	9	14
56 - 61	6	10	15
62 - 67	7	10	16
68 - 72	7	11	17
73 - 78	7	12	18
79 - 84	7	12	19
85 - 90	8	13	20
91 - 96	8	13	21
97 - 100	8	14	22
101 - 105	8	14	23
106 - 110	8	15	24
111 - 115	8	15	25
116 - 120	8	16	26
121 - 125	8	16	27
126 - 130	8	17	28
131 - 135	8	17	29
136 - 140	8	18	30
141 - 145	8	19	31
146 - 150	8	20	32
151 - 157	8	20	33
158 - 164	8	21	34
165 - 171	8	21	35
172 - 178	8	22	36
179 - 186	9	22	37
187 - 193	9	23	38
194 - 200	9	23	39
201 - 207	9	24	40
208 - 215	10	24	41

PART 3: RATING CRITERIA

MALAYSIAN STANDARD

MS 2015: PART 3:2006

PUBLIC TOILETS - PART 3: RATING CRITERIA

ICS: 03.080.30

Descriptors: toilet facility, function, facility occupants, rating scale, remodel, rehabilitation, requirements, serviceability, use

DEPARTMENT OF STANDARDS MALAYSIA

CONTENTS

1. Scope

1.1 This Malaysian Standard specifies a definitive procedure for rating the serviceability of a toilet facility or toilet-related facility, that is, for ascertaining its capability to perform the functions for which it is designed, used or required to be used. A separate scale is used for each topic of serviceability. For each topic a serviceability level is ascertained. Overall serviceability is expressed as a profile of levels (that is, not as a single number), and may be presented as a bar chart. This classification contains pairs of scales for classifying an aspect of the serviceability of toilet facility, that is, the capability of toilet facility to meet certain possible requirements for cleanliness.

1.2 This standard can be used to rate the serviceability of an existing toilet or toilet-related facility that has been planned but not yet built, or which is about to be remodelled or rehabilitated, for example, for which single-line drawings and outline specifications have been prepared.

1.3 This standard specifies how to ascertain serviceability levels for a specific toilet, but not what would cause a toilet to be rated at a given level. That information is found in standard classifications for specific topics of serviceability that contain a set of requirement and rating scales. This practice and one or more such standard classifications are mutually dependent, each requires the other. The format of such standard classifications, and of related information, is described in Annex A. An example of the scales written for such classifications is given in Annex B.

1.4 This standard does not cover building evaluation, building condition reports, nor diagnosis of performance; nor does it cover instruments, tools or quality of measurements for evaluation, condition reports or diagnosis of performance.

1.5 This standard applies only to facilities that are building constructions, parts thereof or building-related. While this standard may be useful in rating the serviceability of facilities that are not building constructions, such facilities are outside the scope of this standard.

1.6 The process for creating or adapting a set of classifications for a specific facility type or category is outside the scope of this standard.

Annex A
(normative)

Cleanliness – Scale for toilet building exterior and surrounding areas

Annex B
(normative)

Cleanliness – Scale for toilets and washrooms building interior

Annex C
(informative)

Format of a classification for the serviceability of a toilet facility type or category

PART 4: CODE OF PRACTICE FOR MAINTENANCE

MALAYSIAN STANDARD

MS 2015: PART 4:2006

PUBLIC TOILETS -
PART 4: CODE OF PRACTICE FOR MAINTENANCE

ICS: 03.080.30

Descriptors: responsibilities, cleaning specifications, cleaning requirements, performance management

DEPARTMENT OF STANDARDS MALAYSIA

CONTENTS

PART 4: CODE OF PRACTICE FOR MAINTENANCE

Scope

This Malaysian Standard is to provide guidance on the basic care and maintenance of public toilet facilities in order to ensure an acceptable degree of cleanliness and user satisfaction.

This Malaysian Standard covers public toilets located within buildings (used by occupants as well as by visitors) or as stand-alone facilities. It also includes staff responsibilities, cleaning specifications, cleaning requirements and performance management.

CLAUSE 4: Cleaning maintenance

1. Responsibilities
2. Cleaning specifications
3. Cleaning requirements
4. Performance management

REFERENCES

- MS 2015:1-2017 Public Toilet – Part 1: Design Criteria
- MS 795, WC flushing cisterns – Part 1: Specification
- MS 1402, Code of practice for sanitary system in buildings – Part 1: Design
- MS 1522, Vitreous china water closet pans – Specification
- MS 1799, Urinal – Specification
- MS 2545, Flush valves – Specification
- MS 2550. Cleaning performance – Commercial and public buildings (bibliography)
- MS 2015: Part 2:2006
- MS 2015: Part 3:2006
- MS 2015: Part 4:2006

Thank You

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