

PLUMBING DESIGN

HOW TO DETERMINE THE NUMBER OF FIXTURE



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AS PER
REVISED
NATIONAL
PLUMBING
CODE 1999
&
UNIFORM
PLUMBING
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HOW TO DETERMINE THE MINIMUM NUMBER OF **PLUMBING FACILITIES**

- **EXAMPLE 1. Three – Storey School Dormitory** with target students / occupants for ground floor of 40 males and 40 females, second floor of 80 males, and third floor of 80 females. How many water closet, urinal, lavatories, and shower should be provided for each floor?

Three – Storey School Dormitory

GROUND FLOOR

FIXTURE	MALE 40	FEMALE 40
W. CLOSET	4-1=2	5+1=6
URINAL	2	0
LAVATORY	3+1=4	3+2=5
SHOWER	5	5+1=6

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)		Bathtubs or Showers (Fixtures per Person)
Male	Female	Male		Male	Female	1 per 8
1 per 10	1 per 8	1 per 25		1 per 12	1 per 12	For females, add
Add 1 fixture for each		Over 150, add 1 fixture for		Over 12 add one fixture for		1 bathtub per 30.
additional 25 males (over		each additional 50 males.		each additional 20 males		Over 150, add 1
10) and 1 for each additional				and 1 for each 15		per 20.
20 females (over 8).				additional females.		

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

Three – Storey School Dormitory

SECOND FLOOR

FIXTURE	MALE 80
W. CLOSET	8+3= 11 -3=8
URINAL	3
LAVATORY	7+3=10
SHOWER	10

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)		Bathtubs or Showers (Fixtures per Person)
Male	Female	Male		Male	Female	1 per 8
1 per 10	1 per 8	1 per 25		1 per 12	1 per 12	For females, add
Add 1 fixture for each		Over 150, add 1 fixture for		Over 12 add one fixture for		1 bathtub per 30.
additional 25 males (over		each additional 50 males.		each additional 20 males		Over 150, add 1
10) and 1 for each additional				and 1 for each 15		per 20.
20 females (over 8).				additional females.		

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

Three – Storey School Dormitory

THIRD FLOOR

FIXTURE	FEMALE 80
W. CLOSET	10+3=13
URINAL	0
LAVATORY	7+5=12
SHOWER	10+2=12

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)		Bathtubs or Showers (Fixtures per Person)
Male	Female	Male		Male	Female	1 per 8
1 per 10	1 per 8	1 per 25		1 per 12	1 per 12	For females, add
Add 1 fixture for each additional 25 males (over 10) and 1 for each additional 20 females (over 8).		Over 150, add 1 fixture for each additional 50 males.		Over 12 add one fixture for each additional 20 males and 1 for each 15 additional females.		1 bathtub per 30.
						Over 150, add 1 per 20.

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

HOW TO DETERMINE THE MINIMUM NUMBER OF **PLUMBING FACILITIES**

- **EXAMPLE 2. Public Building** with target clients of 150 males and 150 females plus 10 male employees and 20 female employees.

One – Storey Public Building

CLIENTS

FIXTURE	HE 150	SHE 150
W. CLOSET	2-1=1	8
URINAL	2	0
LAVATORY	1(2)	1(2)

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)	
Male	Female	Male		Male	Female
1: 1-100	3: 1-50	1: 1-100		1: 1-200	1: 1-200
2: 101-200	4: 51-100	2: 101-200		2: 201-400	2: 201-400
3: 201-400	8: 101-200	3: 201-400		3: 401-750	3: 401-750
	11: 201-400	4: 401-600		Over 750, add one fixture for each additional 500 persons	
Over 400, add one fixture for each additional 500 males and 1 for each additional 150 females.		Over 600 add 1 fixture for each additional 300 males.		PUBLIC	
Male	Female	Male		Male	Female
1: 1-15	1: 1-15	0: 1-9		1 per 40	1 per 40
2: 16-35	3: 16-35	1: 10-50		EMPLOYEE	
3: 36-55	4: 36-55	Add one fixture for each additional 50 males.			
Over 55, add 1 fixture for each additional 40 persons.					

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

One – Storey Public Building

EMPLOYEES

FIXTURE	HE 10	SHE 20
W. CLOSET	1	2
URINAL	1	0
LAVATORY	1	1(2)

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)	
Male	Female	Male		Male	Female
1: 1-100	3: 1-50	1: 1-100		1: 1-200	1: 1-200
2: 101-200	4: 51-100	2: 101-200		2: 201-400	2: 201-400
3: 201-400	8: 101-200	3: 201-400		3: 401-750	3: 401-750
	11: 201-400	4: 401-600		Over 750, add one fixture for each additional 500 persons	
Over 400, add one fixture for each additional 500 males and 1 for each additional 150 females.		Over 600 add 1 fixture for each additional 300 males.		PUBLIC	
Male	Female	Male		Male	Female
1: 1-15	1: 1-15	0: 1-9		1 per 40	1 per 40
2: 16-35	3: 16-35	1: 10-50		EMPLOYEE	
3: 36-55	4: 36-55	Add one fixture for each additional 50 males.			
Over 55, add 1 fixture for each additional 40 persons.					

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

FORMAT FOR THE TEST

STUDENTS per floor

FIXTURE	HE 100	SHE 150
W. CLOSET		
URINAL		
LAVATORY		

TEACHERS

FIXTURE	HE 20	SHE 20
W. CLOSET		
URINAL		
LAVATORY		

TEST 1. 4-Storey Secondary Building

CLIENTS

FIXTURE	HE 250	SHE 150
W. CLOSET		
URINAL		
LAVATORY		

EMPLOYEES

FIXTURE	HE 20	SHE 20
W. CLOSET		
URINAL		
LAVATORY		

TEST 2. 1-Storey Public (LTO) Building

HOW TO DETERMINE THE MINIMUM NUMBER OF **PLUMBING FACILITIES**

- **TEST 1. Four-Storey Secondary School Building** with target students of 100 males (400) and 150 (600) females per floor, faculty room on ground floor with 20 male teachers and 20 female teachers.

4-Storey Secondary Building

STUDENTS per floor

FIXTURE	HE 100	SHE 150
W. CLOSET		
URINAL		
LAVATORY		

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)	
Male	Female	Male		Male	Female
1 per 40	1 per 30	1 per 35		1 per 40	1 per 40

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

4-Storey Secondary Building

TEACHERS

FIXTURE	HE 20	SHE 20
W. CLOSET		
URINAL		
LAVATORY		

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)	Lavatories (Fixtures per Person)	
Male	Female	Male	Male	Female
1: 1-15	1: 1-15	1 per 50	1 per 40	1 per 40
2: 16-35	2: 16-35			
3: 36-55	3: 36-55			
Over 55, add 1 fixture for each additional 40 persons				

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

HOW TO DETERMINE THE MINIMUM NUMBER OF **PLUMBING FACILITIES**

- **TEST 2. Public Building (LTO Office)** with target clients of 250 males and 100 females plus 20 male employees and 20 female employees.

One – Storey Public Building

CLIENTS

FIXTURE	HE 250	SHE 150
W. CLOSET		
URINAL		
LAVATORY		

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)	
Male	Female	Male		Male	Female
1: 1-100	3: 1-50	1: 1-100		1: 1-200	1: 1-200
2: 101-200	4: 51-100	2: 101-200		2: 201-400	2: 201-400
3: 201-400	8: 101-200	3: 201-400		3: 401-750	3: 401-750
	11: 201-400	4: 401-600		Over 750, add one fixture for each additional 500 persons	
Over 400, add one fixture for each additional 500 males and 1 for each additional 150 females.		Over 600 add 1 fixture for each additional 300 males.		PUBLIC	
Male	Female	Male		Male	Female
1: 1-15	1: 1-15	0: 1-9		1 per 40	1 per 40
2: 16-35	3: 16-35	1: 10-50		EMPLOYEE	
3: 36-55	4: 36-55	Add one fixture for each additional 50 males.			
Over 55, add 1 fixture for each additional 40 persons.					

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

One – Storey Public Building

EMPLOYEES

FIXTURE

HE 20

SHE 20

W. CLOSET

URINAL

LAVATORY

TABLE 4-1
Minimum Plumbing Facilities¹

Water Closets ¹⁴ (Fixtures per Person)		Urinals ^{5, 10} (Fixtures per Person)		Lavatories (Fixtures per Person)	
Male	Female	Male		Male	Female
1: 1-100	3: 1-50	1: 1-100		1: 1-200	1: 1-200
2: 101-200	4: 51-100	2: 101-200		2: 201-400	2: 201-400
3: 201-400	8: 101-200	3: 201-400		3: 401-750	3: 401-750
	11: 201-400	4: 401-600		Over 750, add one fixture for each additional 500 persons	
Over 400, add one fixture for each additional 500 males and 1 for each additional 150 females.		Over 600 add 1 fixture for each additional 300 males.		PUBLIC	
Male	Female	Male		Male	Female
1: 1-15	1: 1-15	0: 1-9		1 per 40	1 per 40
2: 16-35	3: 16-35	1: 10-50		EMPLOYEE	
3: 36-55	4: 36-55	Add one fixture for each additional 50 males.			
Over 55, add 1 fixture for each additional 40 persons.					

For each urinal added in excess of the minimum required, one water closet may be deducted. The number of water closets shall not be reduced to less than two-thirds (2/3) of the minimum requirement.

KEY TO CORRECTION

STUDENTS per floor

FIXTURE	HE 100	SHE 150
W. CLOSET	3-1=2	5
URINAL	3	0
LAVATORY	3	4

TEACHERS

FIXTURE	HE 20	SHE 20
W. CLOSET	2	2
URINAL	1	0
LAVATORY	1	1

TEST 1. 4-Storey Secondary Building

CLIENTS

FIXTURE	HE 250	SHE 150
W. CLOSET	3-1=2	2
URINAL	3	0
LAVATORY	2	1 or 2

EMPLOYEES

FIXTURE	HE 20	SHE 20
W. CLOSET	2-1=1	3
URINAL	1 or 2	0
LAVATORY	1 or 2	1 or 2

TEST 2. 1-Storey Public (LTO) Building

TABLE 4-1

MINIMUM PLUMBING FACILITIES

Types of Building or Occupancy ¹	Water Closets (Fixtures per Person)	Urinals ¹⁰ (Fixtures per Person)	Lavatories (Fixtures per Person)	Bathubs or Showers (Fixtures per Person)	Drinking Fountains ¹³
Assembly Places -- Theaters, Auditoriums, Convention Halls, etc. - for permanent employee use	Male 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Female ¹⁴ 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 50 males	Male 1 per 40 Female 1 per 40		
Assembly Places -- Theaters, Auditoriums, Convention Halls, etc. - for public use	Male 1: 1-100 2: 101-200 3: 201-400 Over 400, add 1 fixture for each additional 500 males and 2 for each 300 females	Female ¹⁴ 3: 1-50 4: 51-100 8: 101-200 11: 201-400 Over 400, add 1 fixture for each additional 500 males and 2 for each 300 females	Male 1: 1-200 2: 201-400 3: 401-750 Over 750, add 1 fixture for each additional 500 persons. Female 1: 1-200 2: 201-400 3: 401-750		1 per 75 ¹²
Dormitories ⁹ School or Labor	Male 1 per 10 Add 1 fixture for each additional 25 males (over 10) and 1 for each additional 20 females (over 8)	Female ¹⁴ 1 per 8 Add 1 fixture for each additional 25 males (over 10) and 1 for each additional 20 females (over 8)	Male 1 per 12 Over 150, add 1 fixture for each additional 20 males and 1 for each 15 additional females Female 1 per 12 1 per 12 Over 150, add 1 fixture for each additional 20 males and 1 for each 15 additional females	1 per 8	
Dormitories for staff use	Male 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Female ¹⁴ 1: 1-15 2: 16-35 3: 16-35 4: 36-55 Over 55, add 1 fixture for each additional 40 persons	Male 1 per 50 Female 1 per 40 1 per 40	1 per 8	
Dwellings ⁷ Single Dwelling Multiple Dwelling or Department	1 per dwelling 1 per dwelling or apartment unit		1 per dwelling 1 per dwelling or apartment unit	1 per dwelling 1 per dwelling or apartment unit	
Hospital Waiting Rooms	1 per room		1 per room		1 per 75 ¹²
Hospital for employee use	Male 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Female ¹⁴ 1: 1-15 2: 16-35 3: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Male 1 per 40 Over 150, add 1 fixture for each additional 20 males and 1 for each 15 additional females Female 1 per 40 1 per 40 Over 150, add 1 fixture for each additional 20 males and 1 for each 15 additional females		
Hospitals Individual Room Nursing Room	1 per person 1 per 8 patients		1 per room 1 per 10 patients	1 per room 1 per 20 patients	1 per 75 ¹²

Industrial ⁹ Warehouses Workshops, Foundries and Other establishments (for employee use)	Male 1: 1-10 2: 11-25 3: 26-50 4: 51-75 5: 76-100 Over 100, add 1 fixture for each additional 30 persons	Female 1: 1-10 2: 11-25 3: 26-50 4: 51-75 5: 76-100 Over 100, add 1 fixture for each additional 30 persons	0: 1-9 1: 10-50 Add 1 fixture for each additional 50 males	Up to 100, 1 per 10 persons Over 100, 1 per 15 persons ^{7,8}	1 shower for each 15 persons exposed to excessive heat or to skin contamination with poisonous, infectious, or irritating material	1 per 75 ¹⁷
Institutional- Other than Hospitals or Penal Institutions (on each occupied floor)	Male 1 per 25	Female 1 per 20	0: 1-9 1: 10-50 Add 1 fixture for each additional 50 males	Male 1 per 10 Female 1 per 10	1 per 8	1 per 75 ¹⁷
Institutional- Other than Hospitals or Penal Institution (on each occupied floor) for employee use	Male 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Female ¹⁴ 1: 1-15 3: 16-35 4: 36-55 Over 55, add 1 fixture for each additional 40 persons	0: 1-9 1: 10-50 Add 1 fixture for each additional 50 males	Male 1 per 40 Female 1 per 40	1 per 8	1 per 75 ¹⁷
Office or Public Buildings	Male 1: 1-100 2: 101-200 3: 201-400 Over 55, add 1 fixture for each additional 500 males and 2 for each 55 females	Female ¹⁴ 1: 1-200 2: 201-400 3: 401-750 Over 750, add 1 fixture for each additional 500 persons	1: 1-100 2: 101-200 3: 201-400 4: 401-600 Over 600, add 1 fixture for each additional 300 males	Male 1: 1-200 2: 201-400 3: 401-750 Over 750, add 1 fixture for each additional 500 persons		1 per 75 ¹⁷
Office or Public Buildings - For employee use	Male 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Female ¹⁴ 1: 1-15 3: 16-35 4: 36-55 Over 55, add 1 fixture for each additional 40 persons	0: 1-9 1: 10-50 Add 1 fixture for each additional 50 males	Male 1 per 40 Female 1 per 40		
Penal Institutions - For employee use	Male 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Female ¹⁴ 1: 1-15 3: 16-35 4: 36-55 Over 55, add 1 fixture for each additional 40 persons	0: 1-9 1: 10-50 Add 1 fixture for each additional 50 males	Male 1 per 40 Female 1 per 40		1 per 75 ¹⁷
Penal Institution - For Prison use Cell Exercise Room	1 per cell 1 per exercise room		1 per exercise room	1 per cell 1 per exercise room		1 per cell block floor 1 per exercise room
Restaurants, Pubs and Lounges ¹¹	Male 1: 1-50 2: 51-150 3: 150-300 Over 300, add 1 fixture for each additional 200 persons	Female 1: 1-15 3: 16-35 4: 36-55 Over 300, add 1 fixture for each additional 200 persons	1: 1-150 Over 150, add 1 fixture for each additional 150 males	Male 1: 1-150 2: 151-200 3: 201-400 Over 400, add 1 fixture for each additional 400 persons	Female ¹⁴ 1: 1-150 2: 151-200 3: 201-400 Over 400, add 1 fixture for each additional 400 persons	
Schools - For staff use All schools	Male 1: 1-15 2: 16-35 3: 36-55 Over 55, add 1 fixture for each additional 40 persons	Female 1: 1-15 3: 16-35 4: 36-55 Over 55, add 1 fixture for each additional 40 persons	1 per 50	Male 1 per 40 Female 1 per 40		

Schools - For student use	Male		Female		Male	Female	1 per 75 ¹²
	1: 1-20	2: 21-50	1: 1-20	2: 21-50	1: 1-50	1: 1-25	
Nursery	Over 50, add 1 fixture for each additional 50 persons		Over 50, add 1 fixture for each additional 50 persons		Over 50, add 1 fixture for each additional 50 persons	2: 26-50	1 per 75 ¹²
Elementary	Male		Female		Male	1 female	1 per 75 ¹²
Secondary	1 per 30		1 per 25		1 per 35	1 per 35	1 per 75 ¹²
Others (Colleges, Universities, Adult Centers, etc.)	Male		Female		Male	Female	1 per 75 ¹²
	1 per 40		1 per 30		1 per 40	1 per 30	1 per 75 ¹²
	Male		Female		Male	Female	1 per 75 ¹²
	1 per 40		1 per 30		1 per 40	1 per 30	1 per 75 ¹²
Worship Places	Male		Female ¹⁴		1 per 25	1 per 2 water closets	1 per 75 ¹²
Educational and Activities Unit	1 per 25		1 per 75				
	2: 126-250		2: 76-125				
	3: 126-250						
Worship Places	Male		Female ¹⁴		1 per 150	1 per 2 water closets	1 per 75 ¹²
Principal	1 per 150		1 per 75				

¹³ Whenever urinals are provided, one (1) water closet is subtracted from the number specified on the table, except that the number of water closets in such cases shall not be reduced to less than two-thirds (2/3) of the minimum specified.

1 The figures shown are based upon one (1) fixture being the minimum required for the number of persons indicated or any fraction thereof.

2 Building categories not shown on this table shall be considered separately by the Administrative Authority.

3 Drinking fountains shall not be installed in toilet rooms.

4 Laundry trays. One (1) laundry tray or one (1) automatic washer standpipes, or combination thereof, for each ten (10) apartments, laundry trays or two automatic washer standpipes, or combination thereof, for each ten (10) apartments. Kitchen sinks, one (1) for each dwelling or apartment unit.

5 As required by ANSI Z4.1, Sanitation in Places of Employment.

6 Where there is exposure to skin contamination with poisonous, infectious, or irritating materials, provide one (1) lavatory for each five- (5) persons.

7 Wide 609.6 mm or wash sink 457.2-mm diameter a circular basin, when provided with water outlets for such space, shall be considered equivalent to one (1) lavatory.

8 Laundry trays, one (1) for each fifty (50) persons. Slop sinks, one (1) for each 100 persons.

9 General. In applying this schedule of facilities, consideration must be given to the accessibility of the fixtures. Conformity purely on a numerical basis may not result in an installation suited to the need of the individual establishment. For example, schools should be provided with toilet facilities on each floor having classrooms. Temporary workmen facilities, one (1) water closet and one (1) urinal for each thirty- (30) workmen.

a. Surrounding materials, wall ample floor space to a point 0.6 meter in front of urinal lip and 1.2 m above the floor and at least 0.6 m to each side of the urinal shall be lined with non-absorbent materials.

b. Trough urinals are prohibited.

c. A restaurant is defined as a business, which sells food to be consumed on the premises.

a. The number of occupants for a drive-in restaurant shall be considered as equal to the number of parking stalls.

b. Employee toilet facilities are not be included in the above restaurant requirements. Hand washing facilities must be available in the kitchen for employees.

10 When food is consumed indoors, water stations may be substituted for drinking fountains. Theaters, auditoriums, dormitories, offices, or public buildings for use by more than six (6) persons shall have one (1) drinking fountain for the first seventy-five (75) persons and one (1) additional fountain for each one hundred and fifty (150) persons thereafter.

11 There shall be a minimum of one (1) drinking fountain per occupied floor in schools, theaters, auditoriums, dormitories, offices or public building.

12 The total number of water closets for females shall be at least equal to the total number of water closets and urinals required for males.