Table 7 Minimum Requirements for Fire Fighting Installations

[*Clauses* 4.9(a), 4.9(c), 4.9(e), 5.1.1(a), 5.1.1(d), 5.1.2.1, 5.1.3(a), E-7, H-2(f) *and* Table 2]

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
RESIDENTIAL BUILDINGS (A)													
a)	**Lodging and Rooming Houses (A-1)** (*see* Note 3)												
1)	Less than 15 m in height												
	i) Up to 15 rooms	R	NR	NR	NR	NR	R (*see* Note 4)	NR	NR	NR	5 000 (*see* Note 5)	NR	NR
	ii) More than 15 and up to 30 rooms	R	R	NR	NR	NR	R (*see* Note 4)	NR	NR	NR	5 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
	iii) More than 30 rooms	R	R	NR	NR	NR	R (*see* Note 4)	R (*see* Note 7)	NR	NR	10 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
b)	**One or two Family Private Dwellings (A-2)** (*see* Note 3)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
c)	**Dormitories (A-3) and Apartment Houses (A-4)**												
1)	Less than 15 m in height	R	R	NR	NR	NR	R (*see* Note 4)	NR	NR	NR	5 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2)	15 m and above but not exceeding 35 m in height	R	R	NR	R	NR	R (*see* Note 4)	R (*see* Note 8)	NR	NR	25 000	NR	900
3)	Above 35 m but not exceeding 45 m in height	R	R	R	NR	NR	R (*see* Note 4 and Note 9)	R	NR	75 000	5 000	(*see* Note 10)	NR
4)	Above 45 m in height but not exceeding 60 m in height	R	R	R	NR	R	R	R	NR	150 000	10 000	(*see* Note 11)	NR
5)	Above 60 m in height	R	R	R	NR	R	R	R	R	200 000	10 000	(*see* Note 12 & Note 13)	NR
d)	**Hotels (A-5)**												
1)	Less than 15 m in height												
	i) Floor area not exceeding 300 m^2 on any of the floor	R	R	NR	NR	NR	R (*see* Note 4)	R	NR	NR	5 000 (5000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
	ii) Floor area exceeding 300 m^2 but not more 1 000 m^2 on any of the floor	R	R	R (*see* Note 7)	NR	NR	R (*see* Note 4)	R	R	10 000 for every 500 m^2 floor area subject to minimum of 50 000 (*see* Note 7)	10 000 (5000) (*see* Note 6)	(*see* Note 14 in case of provision of wet riser)	450 (450) (*see* Note 6)
	iii) Floor area exceeding 1 000 m^2 on any of the floor	R	R	R (*see* Note 15)	NR	R	R	R (*see* Note 1)	R	100 000 (*see* Note 15)	10 000 (*see* Note 4)	(*see* Note 15 and Note 14)	NR

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2)	15 m and above but not exceeding 30 m	R	R	R	NR	R	R	R	R	150 000	20 000	(*see* Note 11)	NR
3)	Above 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
e)	**Hotels (A-6)**	R	R	R	NR	R	R	R	R	250 000	20 000	(*see* Note 12)	NR
EDUCATIONAL BUILDINGS (B) (*see* Note 16)													
1)	Less than 15 m in height												
	i) Ground plus one or more storeys	R	R	NR	NR	NR	R (*see* Note 4)	NR	NR	NR	10 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
2)	15 m and above but not exceeding 24 m in height	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	25 000	NR	900
3)	Above 24 m but not exceeding 30 m in height	R	R	R	NR	R	R (*see* Note 4)	R	NR	50 000	(5 000) (*see* Note 6)	(*see* Note 14)	NR
INSTITUTIONAL BUILDINGS (C) (*see* Note 16)													
a)	**Hospitals, Sanatoria and Nursing Homes (C-1)**												
1)	Less than 15 m in height with plot area up to 1 000 m^2												
	i) Up to ground plus one storey, with no beds	R	NR	NR	NR	NR	R (*see* Note 4)	R	NR	NR	(5 000) (*see* Note 6)	NR	(450) (*see* Note 6)

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	ii) Up to ground plus one storey with beds	R	R	NR	NR	NR	R (*see* Note 4)	R	NR	NR	5 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
	iii) Ground plus two or more storeys, with no beds	R	R	NR	R	NR	R (*see* Note 4)	R	R	NR	10 000 (5 000) (*see* Note 6)	NR	900 (450) (*see* Note 6)
	iv) Ground plus two or more storeys, with beds	R	R	R	NR	NR	R	R (*see* Note 1)	R	75 000	10 000	(*see* Note 14)	NR
2)	Less than 15 m in height with plot area more than 1 000 m^2	R	R	R	NR	R	R	R (*see* Note 1)	R	1 00 000	10 000	(*see* Note 14)	NR
3)	15 m and above but not exceeding 24 m in height	R	R	R	NR	R	R	R	R	150 000	20 000	(*see* Note 10)	NR
4)	Above 24 m and not exceeding 45 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
b)	**Custodial (C-2), and Penal and Mental (C-3)**												
1)	Less than 10 m in height												
	i) Up to 300 persons	R	R	NR	NR	NR	R (*see* Note 4)	R	NR	NR	10 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
	ii) More than 300 persons	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	15 000 (5 000) (*see* Note 6)	NR	900 (450) (*see* Note 6)

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
2)	10 m and above but not exceeding 15 m in height	R	R	R	NR	R	R (*see* Note 4)	R	R	100 000	5 000 (5 000) (*see* Note 6)	(*see* Note 10)	NR
3)	15 m and above but not exceeding 24 m in height	R	R	R	NR	R	R	R	R	150 000	10 000	(*see* Note 11)	NR
4)	24 m and above but not exceeding 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
ASSEMBLY BUILDINGS (D) (*see* Note 16)													
a)	**Buildings (D-1 to D-5)**												
1)	Less than 10 m in height												
	i) Up to 300 persons	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	20 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
	ii) More than 300 persons	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	25 000 (5 000) (*see* Note 6)	NR	900 (450) (*see* Note 6)
2)	Above 10 m but not exceeding 15 m in height	R	R	R	NR	NR	R (*see* Note 4)	R (*see* Note 1)	R	100 000	5 000 (5 000) (*see* Note 6)	(*see* Note 10)	450 (450) (*see* Note 6)
3)	Above 15 m but not exceeding 24 m in height	R	R	R	NR	R	R	R	R	150 000	10 000	(*see* Note 10)	NR
4)	Above 24 m but not exceeding 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
b)	**D-6**	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 12)	NR
c)	**D-7**	For details *see* **6.4.4**											

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
BUSINESS BUILDINGS (E)													
1)	Less than 10 m in height	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	10 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
2)	Above 10 m but not exceeding 15 m in height	R	R	R	NR	NR	R (*see* Note 4)	R	R	50 000	5 000 (5 000) (*see* Note 6)	(*see* Note 14)	450 (450) (*see* Note 6)
3)	Above 15 m and up to 24 m in height	R	R	R	NR	R	R	R	R	100 000	10 000	(*see* Note 10)	NR
4)	Above 24 m and up to 30 m in height	R	R	R	NR	R	R	R	R	150 000	20 000	(*see* Note 11)	NR
5)	Above 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 12)	NR
MERCANTILE BUILDINGS (F)													
a)	**F-1 and F-2** (*see* Note 16)												
1)	Less than 15 m in height												
	i) Ground plus one storey, with total of all floor area not exceeding 500 m^2	R	R	NR	NR	NR	R (*see* Note 4)	NR	NR	NR	5 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	ii) Ground plus one storey and total of all floor area exceeding 500 m^2	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	20 000 (5 000) (*see* Note 6)	NR	900 (450) (*see* Note 6)
	iii) More than ground plus one storey	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	25 000 (5 000) (*see* Note 6)	NR	900 (450) (*see* Note 6)
2)	Above 15 m but not exceeding 24 m in height	R	R	R	NR	R	R	R	R	100 000	10 000	(*see* Note 10)	NR
3)	Above 24 m but not exceeding 30 m in height	R	R	R	NR	R	R	R	R	200 000	20 000	(*see* Note 11)	NR
b)	**Underground shopping complex (F-3)**	R	R	R	NR	R	R	R	R	150 000	10 000	(*see* Note 11)	NR
INDUSTRIAL BUILDINGS (G) (*see* Note 17)													
a)	**Low Hazard (G-1)** (*see* Note 18)												
	i) Covered area up to 100 m^2	R	NR	NR	NR	NR	R (*see* Note 4)	NR	NR	NR	5 000 (*see* Note 5)	NR	450 (*see* Note 5)
	ii) Covered area more than 100 m^2 and up to 500 m^2	R	R	NR	R (*see* Note 8)	NR	R (*see* Note 4)	NR	NR	NR	20 000 (5 000) (*see* Note 6)	NR	450 (450) (*see* Note 6)

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	iii) Covered area more than 500 m^2 (for building height up to 15 m)	R	R	NR	R	NR	R (*see* Note 4)	R	NR	NR	20 000 (5000) (*see* Note 6)	NR	450 (450) (*see* Note 6)
	iv) Covered area more than 500 m^2 (for building height above 15 m)	R	R	R	NR	R	R (*see* Note 4)	R	R	75 000	5 000 (*see* Note 6)	(*see* Note 14)	NR
b)	**Moderate Hazard (G-2)** (*see* Note **18**)												
	i) Covered area up to 100 m^2	R	R	NR	NR	NR	R	NR	NR	NR	10 000	NR	450
	ii) Covered area more than 100 m^2 and up to 500 m^2	R	R	NR	NR	NR	R	NR	NR	NR	20 000	NR	900
	iii) Covered area more than 500 m^2 and up to 1000 m^2 (for height up to 15 m)	R	R	NR	R	NR	R	R	R	NR	50 000	NR	900
	iv) Covered area more than 500 m^2 and up to 1000 m^2 (for height above 15 m)	R	R	R	NR	R	R	R	R	100 000	10 000	(*see* Note 14)	NR
	v) Covered area more than 1000 m^2	R	R	R	NR	R	R	R	R	150 000	20 000	(*see* Note 11)	NR

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
c)	**High Hazard (G-3)** (*see* Note 19)												
	i) Covered area up to 50 m^2	R	R	NR	NR	NR	R	NR	NR	NR	10 000	NR	900
	ii) Covered area more than 50 m^2 and up to 150 m^2	R	R	NR	NR	NR	R	R	R	NR	25 000	NR	900
	iii) Covered area more than 150 m^2 and up to 300 m^2	R	R	R	NR	NR	R	R	R	50 000	10 000	(*see* Note 14)	NR
	iv) Covered area more than 300 m^2 and up to 500 m^2	R	R	R	NR	R	R	R	R	100 000	20 000	(*see* Note 10)	NR
	v) Covered area more than 500 m^2	R	R	R	NR	R	R	R	R	150 000	20 000	(*see* Note 11)	NR
STORAGE BUILDINGS (H) (*see* Note 20)													
1)	Below 15 m in height and covered area less than 250 m^2	R	R	NR	NR	NR	R	NR	NR	NR	25 000	NR	900
2)	Below 15 m in height and covered area more than 250 m^2												
	i) Ground floor only	R	R	R	NR	R	R	R	R	50 000	10 000	(*see* Note 14)	450
	ii) Ground plus one floor	R	R	R	NR	R	R	R	R	75 000	10 000	(*see* Note 10)	450

Table 7 — (*Continued*)

Sl No.	Type of Building Occupancy	Type of Installation								Water Supply (litre)		Pump Capacity (litre/min)	
		Fire Exting-uisher	First Aid Hose Reel	Wet Riser	Down Comer	Yard Hydrant	Automatic Sprinkler System	Manually Operated Electronic Fire Alarm Systems (*see* Note 1)	Automatic Detection and Alarm System (*see* Note 2)	Under-ground Static Water Storage Tank Combined Capacity for Wet Riser, Yard Hydrant and Sprinklers per Set of Pumps	Terrace Tank over Respective Tower Terrace	Pump Near Underground Static Water Storage Tank (Fire Pump) with Minimum Pressure of 3.5 kg/cm^2 at Remotest Location	At the Terrace Tank Level with Minimum Pressure of 3.5 kg/cm^2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	iii) More than ground plus one floor	R	R	R	NR	R	R	R	R	100 000	10 000	(*see* Note 10)	450
3)	Multi-Level Car Parking (MLCP)	R	R	R	NR	R	R	R	NR	150 000	10 000	(*see* Note 11)	900
HAZARDOUS BUILDINGS (J) (*see* Note 20)													
1)	Up to 15 m in height												
	i) Single Storey Building	R	R	R	NR	R	R	R	R	Minimum 240 min firefighting requirements	NR	(*see* Note 21)	NR
	ii) More than one floor building but not exceeding 15 m	R	R	R	R	R	R	R	R	Minimum 240 min firefighting requirements	50 000	(*see* Note 21)	900

R – Required
NR – Not Required

NOTES

1 MOEFA System shall also include talk-back system and public address system for the occupancies given in the table for (d) (1) (iii) under A-5, (a) (1) (iv) and (a) (2) under C-1, and (a) (2) under D-1 to D-5, in all buildings 15 m and above in height, except for A-3 and A-4 occupancies where these shall be provided for buildings of height 24 m and above. These shall also be provided in car parking areas more than 300 m^2 and in multi-level car parking irrespective of their areas.

2 Automatic detection and alarm system is not required to be provided in car parking area. Such detection system shall however be required in other areas of car parking such as electrical rooms, cabins and other areas.

3 Buildings above 15 m in height are not to be permitted for occupancies A-1 and A-2.

4 Required to be installed in basement, if area of basement exceeds 200 m^2.

5 Required to be provided if basement area exceeds 200 m^2.

Table 7 — (*Concluded*)

6 Additional value given in parenthesis shall be added if basement area exceeds 200 m^2.

7 Required to be provided for buildings with more than two storeys (Ground + One).

8 Required to be provided for buildings with height above 15 m and above.

9 Sprinklers shall be fed water from both underground static water storage tank and terrace tank.

10 Provide required number of sets of pumps each consisting of one electric and one diesel pump (stand by) of capacity 2 280 litre/min and one electric pump of capacity 180 litre/min (*see* Fig. 11) (*see also* notes 22 and 23).

11 Provide required number of sets of pumps each consisting of two electric and one diesel pump (stand by) of capacity 2 280 litre/min and two electric pump of capacity 180 litre/min (*see* Fig. 12) (*see also* Notes 22 and 23).

12 Provide required number of sets of pumps each consisting of two electric and one diesel pump (stand by) of capacity 2 850 litre/min and two electric pump of capacity 180 litre/min (*see* Fig. 12) (*see also* Notes 22 and 23).

13 Lower levels in high rise buildings 60 m or above in height are likely to experience high pressure and therefore, it is recommended to consider multi-stage, multi-outlet pumps (creating pressure zones) or variable frequency drive pumps or any other equivalent arrangement.

14 Provide required number of sets of pumps each consisting of one electric and one diesel pump (stand by) of capacity 1 620 litre/min and one electric pump of capacity 180 litre/min (*see* Fig. 11) (*see also* Notes 22 and 23).

15 Required to be provided for buildings with more than one storey.

16 Buildings above 30 m in height not to be permitted for Group B, Group C, Group D and Group F occupancies.

17 The requirements given in this table for Group G Industrial Buildings are for small scale industry units. For other industries the requirements will have to be worked out on the basis of relevant Indian Standards and also in consultation with the local fire authorities.

18 Buildings above 18 m in height not to be permitted for G-1 and G-2 occupancies.

19 Buildings above 15 m in height not to be permitted for G-3 occupancies.

20 Buildings above 15 m in height not to be permitted for Group H and Group J occupancies. However, buildings above 45 m in height shall not be permitted for multi-level car parking (MLCP) occupancy.

21 Pump capacity shall be based on the covered area of the building.

22 One set of pumps shall be provided for each 100 hydrants or part thereof, with a maximum of two sets. In case of more than one pump set installation, both pump sets shall be interconnected at their delivery headers.

23 Alternative to provisions of additional set of pumps, the objective can be met by providing additional diesel pump of the same capacity and doubling the water tank capacity as required for one set of pumps.

24 As per the requirement of local authority dry riser may be used in hilly areas, industrial areas or as required.