Table 5.2 Total time required to travel between terminal floors in different types of building

Building type	Transit time (s)
Offices:	
large	17–20
small	20
Hotels:	
large	17–20
small	20
Hospitals	24
Nursing and residential homes	24
Residential buildings	20–30
Factories and warehouses	24–40
Shops	24–40

Table 5.3 Typical lift dynamics

Lift travel (m)	Rated speed (m/s)	Acceler -ation (m/s^2)	Single floor flight time (s)
<20	<1.00	0.4	10.0
20	1.00	0.4–0.7	7.0
32	1.60	0.7–0.8	6.0
50	2.50	0.8–0.9	5.5
63	3.15	1.0	5.0
100	5.00	1.2–1.5	4.5
120	6.00	1.5	4.3
>120	>6.00	1.5	4.3

Table 5.6 Typical door closing and opening times

Door operation	Opening (advanced)		Opening (normal)		Closing (normal)	
Door type	800	1100	800	1100	800	1100
Side	1.0	1.5	2.5	3.0	3.0	4.0
Centre	0.5	0.8	2.0	2.5	2.0	3.0

Table 6.1 Estimation of population

Building type	Population estimate
Hotel	1.5–1.9 persons/room
Flats	1.5–1.9 persons/bedroom
Hospital	3.0 persons/bedspace*
School	0.8–1.2 m^2 net area/pupil
Office (multiple tenancy):	
regular	10–12 m^2 net area/person
prestige	15–25 m^2 net area/person
Office (single tenancy):	
regular	8–10 m^2 net area/person
prestige	12–20 m^2 net area/person

* Patient plus three others (doctors, nurses, porters, etc.).

Table 6.2 Percentage arrival rates

Building type	Arrival rate
Hotel	10–15%
Flats	5–7%
Hospital	8–10%
School	15–25%
Office (multiple tenancy):	
regular	11–15%
prestige	17%
Office (single tenancy):	
regular	15%
prestige	17–25%

Table 6.3 Uppeak intervals

Building type	Interval (s)
Hotel	30–50
Flats	40–90
Hospital	30–50
School	30–50
Office (multiple tenancy):	
regular	25–30
prestige	20–25
Office (single tenancy):	
regular	25–30
prestige	20–25

Traffic Data Tables

Table 6.4 Uppeak performance – numerical values

Car load(%)	*AWTIINT* (%)	Car load(%)	*AWTIINT* (%)
30	0.32	75	0.74
40	0.35	80	0.85
50	0.40	85	1.01
60	0.50	90	1.30
70	0.65	95	1.65

Table 6.6 Summary of times

Time	Aim for:	Poor
AWT	<20 s	>25 s
ATT	<60 s	>70 s
AJT	<80 s	>90 s

Legend
AWT Average waiting time
ATT Average travel time
AJT Average journey time

Table 6.5 Office Building Average System Response Time Performance

Grade of Service	Percentage of calls answered in		Time to answer call (s)	
	30 s	60 s	50%	90%
Excellent	>75	>98	20	45
Good	>70	>95	22.5	50
Fair	>65	>92	25	55
Poor/unacceptable	<65	<92	>25	>55

Table 7.2 Car loading and car capacity

Rated load (kg) (*RL*)	Max area (m^2) (*CA*)	Rated capacity (persons) (*CC*)	Actual capacity (persons) (*AC*)	Design capacity (persons) (*DC*)	Capacity factor (%) (*CF*)	Actual load (kg) (*AL*)
320	0.95	4	4.5	3.6	90	338
450	1.30	6	6.2	5.0	82	465
630	1.66	8	7.9	6.3	79	593
800	2.00	10	9.5	7.6	76	713
1000	2.40	13	11.4	9.1	70	855
1275	2.90	16	13.8	11.0	69	1035
1600	3.56	21	16.9	13.5	64	1268
1800	3.92	24	18.6	14.9	62	1395
2000	4.20	26	20.0	16.0	62	1500
2500	5.00	33	23.8	19.0	58	1785

Table 8.9 Occupancy factors for residential buildings

Type	Luxury	Normal	Low income
Studio	1.0	1.5	2.0
1 Bedroom	1.5	1.8	2.0
2 Bedroom	2.0	3.0	4.0
3 Bedroom	3.0	4.0	6.0

Table 8.10 Design criteria: Residential buildings (5-minute, two way)

Type	Interval (s)	Handling capacity
Low income	≤50–70	≥5–7%
Normal	≤50–60	≥6–8%
Luxury	≤45–50	≥8%

Table 5.1 Values of H and S for EN81 rated capacities *

Floors	6 (4.8)		8 (6.4)		10(8.0)		13(10.4)		16(12.8)		21(16.8)		26(20.8)		33 (26.4)	
N	H	S	H	S	H	S	H	S	H	S	H	S	H	S	H	S
5	4.6	3.3	4.7	3.8	4.8	4.2	4.9	4.5	4.9	4.7	5.0	4.9	5.0	5.0	5.0	5.0
6	5.4	3.5	5.6	4.1	5.7	4.6	5.8	5.1	5.9	5.4	6.0	5.7	6.0	5.9	6.0	6.0
7	6.2	3.7	6.5	4.4	6.6	5.0	6.8	5.6	6.8	6.0	6.9	6.5	7.0	6.7	7.0	6.9
8	7.1	3.8	7.4	4.6	7.5	5.3	7.7	6.0	7.8	6.6	7.9	7.2	7.9	7.5	8.0	7.8
9	7.9	3.9	8.2	4.8	8.4	5.5	8.6	6.4	8.7	7.0	8.8	7.8	8.9	8.2	9.0	8.6
10	8.7	4.0	9.1	4.9	9.3	5.7	9.5	6.7	9.7	7.4	9.8	8.3	9.9	8.9	9.9	9.4
11	9.6	4.0	10.0	5.0	10.2	5.9	10.5	6.9	10.6	7.8	10.8	8.8	10.8	9.5	10.9	10.1
12	10.4	4.1	10.8	5.1	11.1	6.0	11.4	7.1	11.5	8.1	11.7	9.2	11.8	10.0	11.9	10.8
13	11.2	4.1	11.7	5.2	12.0	6.1	12.3	7.3	12.5	8.3	12.7	9.6	12.8	10.5	12.9	11.4
14	12.1	4.2	12.6	5.3	12.9	6.3	13.2	7.5	13.4	8.6	13.6	10.0	13.7	11.0	13.8	12.0
15	12.9	4.2	13.4	5.4	13.8	6.4	14.1	7.7	14.3	8.8	14.6	10.3	14.7	11.4	14.8	12.6
16	13.7	4.3	14.3	5.4	14.7	6.5	15.0	7.8	15.3	9.0	15.5	10.6	15.7	11.8	15.8	13.1
17	14.5	4.3	15.3	5.5	15.6	6.5	16.0	8.0	16.2	9.2	16.5	10.9	16.6	12.2	16.8	13.6
18	15.4	4.3	16.0	5.5	16.6	6.6	16.9	8.1	17.1	9.3	17.4	11.1	17.6	12.5	17.7	14.0
19	16.2	4.3	16.9	5.6	17.4	6.7	17.8	8.2	18.1	9.5	18.4	11.3	18.5	12.8	18.7	14.4
20	17.0	4.4	17.8	5.6	18.2	6.7	18.7	8.3	19.0	9.6	19.3	11.6	19.5	13.1	19.7	14.8
21	17.9	4.4	18.6	5.6	19.1	6.8	19.6	8.4	19.9	9.8	20.3	11.7	20.5	13.4	20.6	15.2
22	18.7	4.4	19.5	5.7	20.0	6.8	20.5	8.4	20.9	9.9	21.2	11.9	21.4	13.6	21.6	15.6
23	19.5	4.4	20.4	5.7	20.9	6.9	21.4	8.5	21.8	10.0	22.1	12.1	22.4	13.9	22.6	15.9
24	20.3	4.4	21.2	5.7	21.8	6.9	22.4	8.6	22.7	10.1	23.1	12.3	23.3	14.1	23.5	16.2

* 80% capacity shown in parentheses. N is the number of floors above the main terminal.

Table 6.8a Values of H and S for different values of P from 5 to 12 persons

Floors	5		6		7		8		9		10		11		12	
N	H	S	H	S	H	S	H	S	H	S	H	S	H	S	H	S
5	4.6	3.4	4.7	3.7	4.8	4.0	4.8	4.2	4.9	4.3	4.9	4.5	4.9	4.6	4.9	4.7
6	5.4	3.6	5.6	4.0	5.7	4.3	5.7	4.6	5.8	4.8	5.8	5.0	5.9	5.2	5.9	5.3
7	6.3	3.8	6.4	4.2	6.5	4.6	6.6	5.0	6.7	5.3	6.7	5.5	6.8	5.7	6.8	5.9
8	7.1	3.9	7.3	4.4	7.4	4.9	7.5	5.3	7.6	5.6	7.7	5.9	7.7	6.2	7.8	6.4
9	8.0	4.0	8.2	4.6	8.3	5.1	8.4	5.5	8.5	5.9	8.6	6.2	8.7	6.5	8.7	6.8
10	8.8	4.1	9.0	4.7	9.2	5.2	9.3	5.7	9.4	6.1	9.5	6.5	9.6	6.9	9.6	7.2
11	9.6	4.2	9.9	4.8	10.1	5.4	10.2	5.9	10.3	6.3	10.4	6.8	10.5	7.1	10.6	7.5
12	10.5	4.2	10.7	4.9	11.0	5.5	11.1	6.0	11.2	6.5	11.3	7.0	11.4	7.4	11.5	7.8
13	11.3	4.3	11.6	5.0	11.8	5.6	12.0	6.1	12.1	6.7	12.3	7.2	12.3	7.6	12.4	8.0
14	12.1	4.3	12.5	5.0	12.7	5.7	12.9	6.3	13.0	6.8	13.2	7.3	13.3	7.8	13.4	8.2
15	13.0	4.4	13.3	5.1	13.6	5.7	13.8	6.4	14.0	6.9	14.1	7.5	14.2	8.0	14.3	8.4
16	13.8	4.4	14.2	5.1	14.5	5.8	14.7	6.5	14.9	7.0	15.0	7.6	15.1	8.1	15.2	8.6
17	14.6	4.4	15.0	5.2	15.3	5.9	15.6	6.5	15.8	7.1	15.9	7.7	16.0	8.3	16.1	8.8
18	15.5	4.5	15.9	5.2	16.2	5.9	16.5	6.6	16.7	7.2	16.8	7.8	16.9	8.4	17.1	8.9
19	16.3	4.5	16.8	5.3	17.1	6.0	17.4	6.7	17.6	7.3	17.7	7.9	17.9	8.5	18.0	9.1
20	17.1	4.5	17.6	5.3	18.0	6.0	18.2	6.7	18.5	7.4	18.6	8.0	18.8	8.6	18.9	9.2
21	18.0	4.5	18.5	5.3	18.8	6.1	19.1	6.8	19.4	7.5	19.6	8.1	19.7	8.7	19.8	9.3
22	18.8	4.6	19.3	5.4	19.7	6.1	20.0	6.8	20.3	7.5	20.5	8.2	20.6	8.8	20.8	9.4
23	19.6	4.6	20.2	5.4	20.6	6.2	20.9	6.9	21.2	7.6	21.4	8.3	21.5	8.9	21.7	9.5
24	20.5	4.6	21.1	5.4	21.5	6.2	21.8	6.9	22.1	7.6	22.3	8.3	22.5	9.0	22.6	9.6

N is the number of floors above the main terminal.

Table 6.8b Values of H and S for different values of P from 13 to 20 persons

Floors	13		14		15		16		17		18		19		20	
N	H	S	H	S	H	S	H	S	H	S	H	S	H	S	H	S
5	4.9	4.7	5.0	4.8	5.0	4.8	5.0	4.9	5.0	4.9	5.0	4.9	5.0	4.9	5.0	4.9
6	5.9	5.4	5.9	5.5	5.9	5.6	5.9	5.7	6.0	5.7	6.0	5.8	6.0	5.8	6.0	5.8
7	6.9	6.1	6.9	6.2	6.9	6.3	6.9	6.4	6.9	6.5	6.9	6.6	6.9	6.6	7.0	6.7
8	7.8	6.6	7.8	6.8	7.9	6.9	7.9	7.1	7.9	7.2	7.9	7.3	7.9	7.4	7.9	7.4
9	8.7	7.1	8.8	7.3	8.8	7.5	8.8	7.6	8.8	7.8	8.9	7.9	8.9	8.0	8.9	8.1
10	9.7	7.5	9.7	7.7	9.8	7.9	9.8	8.1	9.8	8.3	9.8	8.5	9.8	8.6	9.9	8.8
11	10.6	7.8	10.7	8.1	10.7	8.4	10.7	8.6	10.8	8.8	10.8	9.0	10.8	9.2	10.8	9.4
12	11.6	8.1	11.6	8.5	11.6	8.7	11.7	9.0	11.7	9.3	11.7	9.5	11.8	9.7	11.8	9.9
13	12.5	8.4	12.5	8.8	12.6	9.1	12.6	9.4	12.7	9.7	12.7	9.9	12.7	10.2	12.8	10.4
14	13.4	8.7	13.5	9.0	13.5	9.4	13.6	9.7	13.6	10.0	13.7	10.3	13.7	10.6	13.7	10.8
15	14.4	8.9	14.4	9.3	14.5	9.7	14.5	10.0	14.6	10.4	14.6	10.7	14.6	11.0	14.7	11.2
16	15.3	9.1	15.4	9.5	15.4	9.9	15.5	10.3	15.5	10.7	15.6	11.0	15.6	11.3	15.6	11.6
17	16.2	9.3	16.3	9.7	16.4	10.2	16.4	10.6	16.5	10.9	16.5	11.3	16.6	11.6	16.6	11.9
18	17.2	9.4	17.2	9.9	17.3	10.4	17.4	10.8	17.4	11.2	17.5	11.6	17.5	11.9	17.6	12.3
19	18.1	9.6	18.2	10.1	18.2	10.6	18.3	11.0	18.4	11.4	18.4	11.8	18.5	12.2	18.5	12.6
20	19.0	9.7	19.1	10.2	19.2	10.7	19.3	11.2	19.3	11.6	19.4	12.1	19.4	12.5	19.5	12.8
21	19.9	9.9	20.0	10.4	20.1	10.9	20.2	11.4	20.3	11.8	20.3	12.3	20.4	12.7	20.4	13.1
22	20.9	10.0	21.0	10.5	21.1	11.1	21.1	11.5	21.2	12.0	21.3	12.5	21.3	12.9	21.4	13.3
23	21.8	10.1	21.9	10.7	22.0	11.2	22.1	11.7	22.2	12.2	22.2	12.7	22.3	13.1	22.3	13.5
24	22.7	10.2	22.9	10.8	22.9	11.3	23.0	11.9	23.1	12.4	23.2	12.8	23.2	13.3	23.3	13.8

N is the number of floors above the main terminal.

Annex E (normative)
Safety signs and warning notices

Safety signs and warning notices should be provided on, or adjacent to, doors or traps giving access to the well, machinery spaces/pulley spaces and machine rooms/pulley rooms and wherever recommended or required. The wording of these notices should be in accordance with BS EN 81-1:1998, Clause **15** and BS EN 81-2:1998, Clause **15**.

NOTE Attention is drawn to the Health and Safety (Safety Signs and Signals) Regulations 1996 [32], which require employers to provide specific safety signs whenever there is a risk that has not been avoided or controlled by other means, e.g. by engineering controls. The signboards specified in the Regulations are covered by BS 5378-1 and BS 5378-3.

Typical examples of safety signs and warning notices are given in BS 7255:2001, where the safety signs are in accordance with BS 5378-3. The diameter or height of safety signs should be not less than 120 mm and the height of the sign plate and the lettering of the warning notices thereon should follow the preferred relationships recommended in BS 5499-1.

Annex F (informative)
Typical traffic calculation method

NOTE 1 Examples of traffic calculations are given in Annex G.

NOTE 2 This is a simplified method. Refer to CIBSE Guide D:2000 [36], section 3, for more complex calculations and where additional references can be found.

F.1 Formulae

The round trip time (*RTT*), in seconds (s), of a single lift during up-peak traffic can be calculated using equation F.1.

$$RTT = 2H\frac{d_f}{v} + [S+1]\left[t_c + t_f(1) + t_o - \frac{d_f}{v}\right] + 2Pt_p \qquad \text{(F.1)}$$

where

H is the average highest reversal floor;

d_f is the average interfloor height, in metres (m);

v is the rated speed, in metres per second (m/s);

S is the average probable number of stops;

t_c is the door closing time, in seconds (s);

$t_f(1)$ is the single floor flight time, in seconds (s);

t_o is the door opening time, in seconds (s);

P is the average number of passengers in the car;

t_p is the average passenger transfer time, in seconds (s).

NOTE 1 Average values for H and S can be obtained from Table F.1, which assumes equal floor populations. These tables are calculated for the average highest reversal floor (H) and the average probable number of stops (S) for buildings with 5 to 24 floors (N) served above the main terminal using the rated car capacities (CC) in the BS ISO 4190 series. The rated car capacity is given by the formula in BS EN 81-1:1998, **8.2.3**a) or BS EN 81-2:1998, **8.2.3**a), as appropriate. The average number of passengers (P) shown in parentheses is assumed to be 80 % of the rated capacity.

NOTE 2 The term $t_c + t_f(1) + t_o$ can better be expressed as a performance time (T), which is the time from the instant when the doors start to close to the time when they are open to 800 mm at the next adjacent floor. Typical performance times for a floor height of 3.3 m are 8.0 s for an excellent system, 10.0 s for an average system and 12.0 s for a poor system. The lift contractor can provide these figures.

NOTE 3 The passenger transfer time (t_p) can only be estimated. Typical values are 0.8 s for a very busy office building to 2.0 s for a residential care home. An average passenger transfer time of 1.2 s can be assumed.

Table F.1 — Values of H and S for rated capacities 6 persons to 33 persons

No. of floors, N	Values of H and S															
	CC=6 (P = 4.8)		CC=8 (P = 6.4)		CC=10 (P = 8.0)		CC=13 (P = 10.4)		CC=16 (P = 12.8)		CC=21 (P = 16.8)		CC=26 (P = 20.8)		CC=33 (P = 26.4)	
	H	S	H	S	H	S	H	S	H	S	H	S	H	S	H	S
5	4.6	3.3	4.7	3.8	4.8	4.2	4.9	4.5	4.9	4.7	5.0	4.9	5.0	5.0	5.0	5.0
6	5.4	3.5	5.6	4.1	5.7	4.6	5.8	5.1	5.9	5.4	6.0	5.7	6.0	5.9	6.0	6.0
7	6.2	3.7	6.5	4.4	6.6	5.0	6.8	5.6	6.8	6.0	6.9	6.5	7.0	6.7	7.0	6.9
8	7.1	3.8	7.4	4.6	7.5	5.3	7.7	6.0	7.8	6.6	7.9	7.2	7.9	7.5	8.0	7.8
9	7.9	3.9	8.2	4.8	8.4	5.5	8.6	6.4	8.7	7.0	8.8	7.8	8.9	8.2	9.0	8.6
10	8.7	4.0	9.1	4.9	9.3	5.7	9.5	6.7	9.7	7.4	9.8	8.3	9.9	8.9	9.9	9.4
11	9.6	4.0	10.0	5.0	10.2	5.9	10.5	6.9	10.6	7.8	10.8	8.8	10.8	9.5	10.9	10.1
12	10.4	4.1	10.8	5.1	11.1	6.0	11.4	7.1	11.5	8.1	11.7	9.2	11.8	10.0	11.9	10.8
13	11.2	4.1	11.7	5.2	12.0	6.1	12.3	7.3	12.5	8.3	12.7	9.6	12.8	10.5	12.9	11.4
14	12.1	4.2	12.6	5.3	12.9	6.3	13.2	7.5	13.4	8.6	13.6	10.0	13.7	11.0	13.8	12.0
15	12.9	4.2	13.4	5.4	13.8	6.4	14.1	7.7	14.3	8.8	14.6	10.3	14.7	11.4	14.8	12.6
16	13.7	4.3	14.3	5.4	14.7	6.5	15.0	7.8	15.3	9.0	15.5	10.6	15.7	11.8	15.8	13.1
17	14.5	4.3	15.3	5.5	15.6	6.5	16.0	8.0	16.2	9.2	16.5	10.9	16.6	12.2	16.8	13.6
18	15.4	4.3	16.0	5.5	16.6	6.6	16.9	8.1	17.1	9.3	17.4	11.1	17.6	12.5	17.7	14.0
19	16.2	4.3	16.9	5.6	17.4	6.7	17.8	8.2	18.1	9.5	18.4	11.3	18.5	12.8	18.7	14.4
20	17.0	4.4	17.8	5.6	18.2	6.7	18.7	8.3	19.0	9.6	19.3	11.6	19.5	13.1	19.7	14.8
21	17.9	4.4	18.6	5.6	19.1	6.8	19.6	8.4	19.9	9.8	20.3	11.7	20.5	13.4	20.6	15.2
22	18.7	4.4	19.5	5.7	20.0	6.8	20.5	8.4	20.9	9.9	21.2	11.9	21.4	13.6	21.6	15.6
23	19.5	4.4	20.4	5.7	20.9	6.9	21.4	8.5	21.8	10.0	22.1	12.1	22.4	13.9	22.6	15.9
24	20.3	4.4	21.2	5.7	21.8	6.9	22.4	8.6	22.7	10.1	23.1	12.3	23.3	14.1	23.5	16.2

The up-peak interval (*INT*), in seconds (*s*), of a group of (*L*) lifts can be calculated using equation F.2.

$$INT = \frac{RTT}{L} \quad \text{(F.2)}$$

The up-peak handling capacity (*HC*), in persons per 5 min, of a group of (*L*) cars can be calculated using equation F.3.

$$HC = \frac{300PL}{RTT} = \frac{300P}{INT} \quad \text{(F.3)}$$

The percentage (%*POP*) of the total daily population (*POP*) above the main terminal floor that can be served during up-peak traffic can be calculated using equation F.4.

$$\%POP = \frac{HC}{POP} \times 100 \quad \text{(F.4)}$$

Annex G (informative)
Examples of traffic calculations

G.1 Determination of car size

If the handling capacity (*HC*) and interval (*INT*) of a target system are known, they can be used to estimate the rated car capacity (*CC*) required. For example, if the required interval is 30 s and the required handling capacity is 100 persons per 5 min, the rated car capacity can be calculated as follows:

Given data:

Required interval:	30 s
Required handling capacity:	100 persons per 5 min

Calculation:

Number of trips in 5 min period:	300/30 = 10
Number of persons in the lift per trip	100/10 = 10
Rated car capacity (*CC*) will be:	10/0.8 = 12.5

The nearest standard car size from the BS ISO 4190 series has a rated car capacity of 13 persons, so *P* will be 13 persons × 80 %, i.e. 10.4 persons.

NOTE For statistical reasons, when sizing a lift system, each car is assumed to fill to an average of 80 % capacity on each trip.

G.2 Calculation of lift performance from known data

The building referred to in **G.1** has 10 floors, at an interfloor distance of 3.3 m. The rated speed is 1.6 m/s (Table 5) and the performance time is 10.0 s (obtained from the lift contractor).

Given data:

Required interval:	30 s
Required handling capacity:	100 persons per 5 min
Number of floors to be served	10
Rated capacity:	13 persons
Rated speed:	1.6 m/s
Performance time:	10.0 s

Derived data:

P = 10.4 (13 persons × 80 %, see Note to **G.1**)

H = 9.5 (from Table F.1)

S = 6.7 (from Table F.1)

t_p = 1.2 s (assumed)

Calculation:

The round trip time (*RTT*), in seconds (s), calculated from equation F.1, would be:

$$RTT = 2 \times 9.5 \times \frac{3.3}{1.6} + [9.5 + 1]\left[10 - \frac{3.3}{1.6}\right] + 2 \times 10.4 \times 1.2$$

$$= 39.1 + 83.4 + 25.9$$

$$= 148.4$$

The required interval is 30 s. As there can only be an integer number of lifts, it is necessary to divide the round trip time of 148.4 s by an integer number to achieve an interval close to 30 s. Select five lifts, then calculate the interval (*INT*), in seconds (s), using equation F.2:

$INT = 148.4/5 = 29.7$

The up-peak handling capacity (*HC*), in persons per 5 min, calculated from equation F.3, would be:

$HC = 109$

NOTE 1 This is a little larger than required.

The provision of five 13-person lifts would be satisfactory.

NOTE 2 Specialist advice can be taken before any final schemes are established.

G.3 Calculation of lift performance from estimated data

NOTE 1 This is an example of one solution for this particular set of data. There will be other solutions that might require specialist advice.

An office building has eight floors above ground, each with a 3.3 m interfloor distance and 1 526 m^2 gross area.

Given data:

Number of floors to be served:	8
Gross floor area:	1 526 m^2
Interfloor distance:	3.3 m

Assumed data:

Interval:	30 s (see Table 6)
Floor density:	one person per 12 m^2 (see Table 6)
Gross to usable ratio:	80 % (see **6.4.2**)
Attendance ratio:	90 % (see **6.4.2**)
Peak arrival rate:	12 % (see Table 6)
Rated speed:	1.6 m/s (see Table 5)
Performance time:	8.0 s
Passenger transfer time:	1.2 s

NOTE 2 Total travel distance: = 8 floors × 3.3 m = 26.4 m.

Derived data:

Usable area per floor:	1 526 m^2 × 80 % = 1 221 m^2
Total possible population:	1 221 × (8/12) = 814 persons
Total daily population:	814 persons × 90 % = 740 persons
Required handling capacity:	740 persons × 12 % = 89 persons per 5 min

Calculation:

Number of trips in 5 min	300/30 = 10
Average car occupancy:	89/10 = 8.9 persons
Rated car capacity:	8.9/0.8 = 11.1 persons

NOTE 3 The nearest standard car size from the BS ISO 4190 series has a rated car capacity of 13 persons, so P will be 13 persons × 80 %, i.e. 10.4 persons.

$P = 10.4$
$H = 7.7$ (from Table F.1)
$S = 6.0$ (from Table F.1)

The round trip time (RTT), in seconds (s), calculated from equation F.1, would be:

$$RTT = 2 \times 7.7 \times \frac{3.3}{1.6} + [6.0 + 1.0]\left[8.0 - \frac{3.3}{1.6}\right] + 2 \times 10.4 \times 1.2$$

$= 98.3$

The up-peak interval (INT), in seconds (s), calculated from equation F.2 and assuming three lifts, would be:

$INT = 98.3/3 = 32.8$

The up-peak handling capacity (HC), in persons per 5 min, calculated from equation F.3, would be:

$HC = 300 \times 10.4/32.8 = 95.1$

The percentage ($\%POP$) of the total daily population (POP) above the main terminal floor that can be served during up-peak, calculated from equation F.4, would be:

$\%POP = 95.1 \times 100/740 = 12.9$

NOTE 4 A handling capacity of 95.1 persons per 5 min can be provided by three 13-person cars. This is more than the required handling capacity of 89 persons per 5 min (see *Derived data*). However, the interval is longer at 32.8 s than the required interval of 30 s (see *Assumed data*). In practice, the cars would fill to less than 10.4 persons per trip, when the round trip time and interval would shorten, until the handling capacity of the lifts equalled the passenger arrival rate.

Annex H (informative)
Provision of lifts for disabled people

Information, recommendations and requirements that are relevant to the provision of lifts for disabled people are given in a large number of documents, including:

— BS 5588;
— BS 5776;
— BS 5900;
— BS 5965;
— BS 6440;
— BS 8300;
— BS EN 81-1 and BS EN 81-2;
— prEN 81-5;
— prEN 81-6;
— prEN 81-7;
— prEN 81-70;
— Building Regulations 2000 [1], Approved Document M.