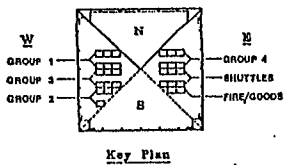
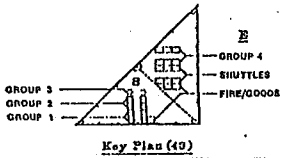


HOPEWELL CENTRE LIFT LAYOUT CHART

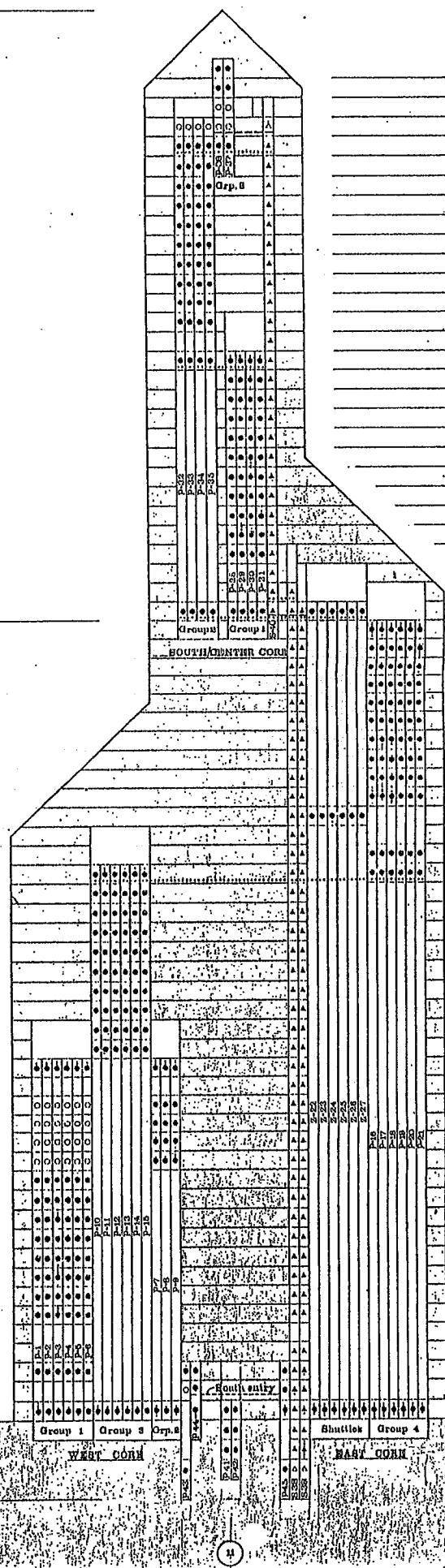
Key:

- PASSENGER LIFT OPENING - UNRESTRICTED
- PASSENGER LIFT OPENING - RESTRICTED BYCE.
- ▲ FIREMEN'S GOODS LIFT OPNG. - UNRESTRICTED
- △ FIREMEN'S GOODS LIFT OPNG. - RESTRICTED BYCE.
- LIFT TRANSFER - PUBLIC
- LIFT TRANSFER - FIRE BRIGADE

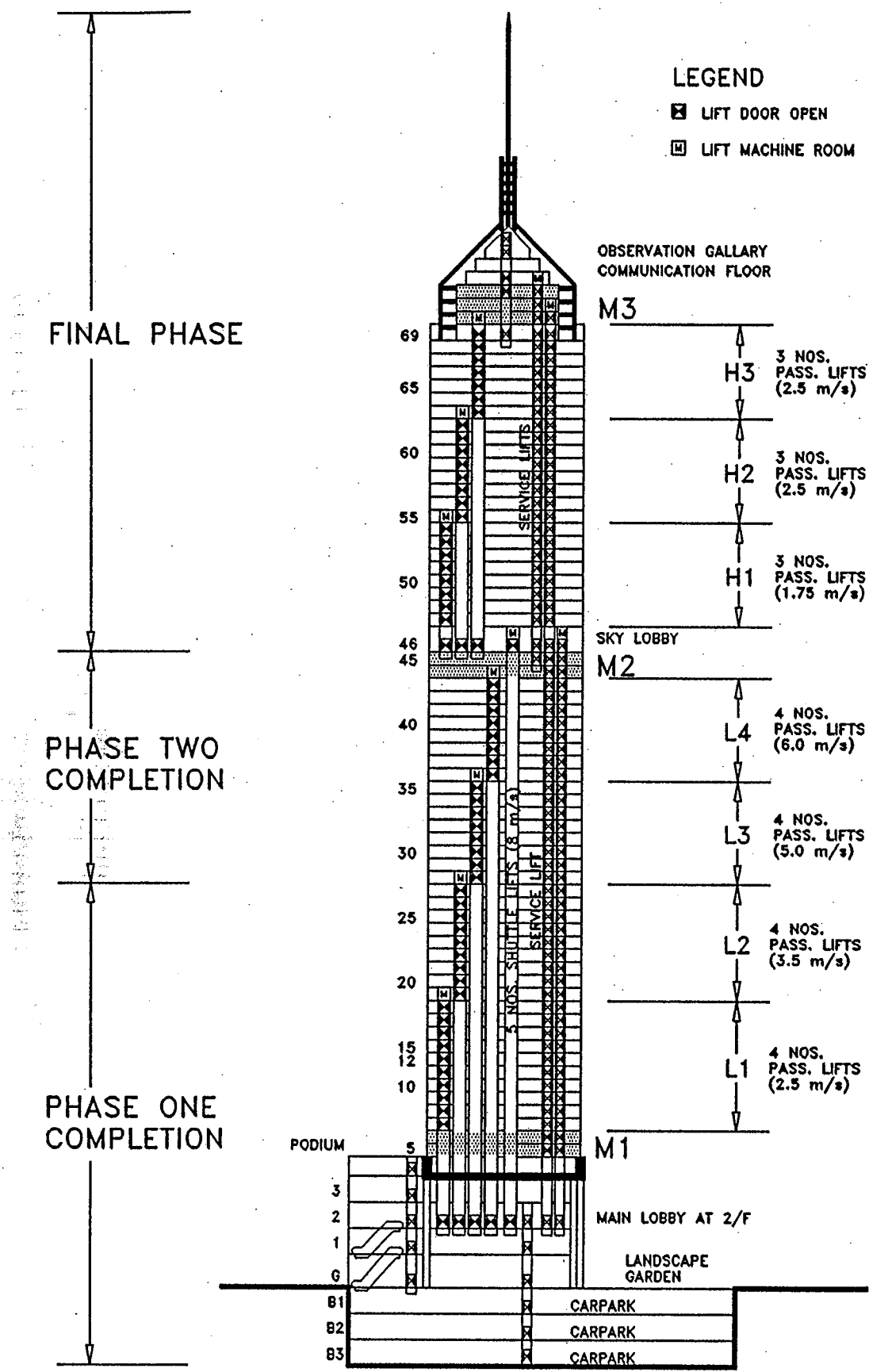


ZONE II

ZONE I



mech.	70
mech.	69
fire brig transfer/exco suite	68
lift transfer	67
	66
	65
	64
	63
	62
	61
	60
	59
	58
mech.	67
transfer	66
	65
	64
	63
	62
	61
	60
	49
	48
	47
	46
mech.	45
mech.	44
groups lift transfer	43
lift & fire brigade transfer	42
	41
	40
	39
	38
	37
	36
	35
	34
	33
public restaurant	32
mech.	31
	30
transfer	29
	28
	27
	26
	25
	24
	23
	22
	21
	20
	19
canteen	18
mech.	18
exco dining	17
exco banking	16
exco banking	15
exco banking	14
	13
	12
assembly hall	11
	10
	9
	8
	7
	6
mech.	5
mech.	4
banking hall	3
	2
Queensway/North entry	1
service/exco park	1
car park R	
valet	
lift	



VERTICAL TRANSPORTATION OF CENTRAL PLAZA

[Extracted from web-based case study on Central Plaza, Wanchai, Hong Kong, <http://arch.hku.hk/teaching/cases/centplaz/centplaz.htm>]

Lifts and Escalators

The design and space requirements for the lifts serving the office tower have a major impact on the usable space on the floors and the core design. By carrying out a lift traffic analysis, a design criteria was set for the anticipated population in the building. This assumption set for population criteria is one of the most important steps that has to be made in the whole lift study. Any variation in this assumption after the fixing the core design will ruin the previous lift study or in the worse case, additional lifts might be required which again may affect the completed core design. After a field survey, a population density of 11.15 m² usable floor area per person was suggested and the total population of about 8,700 was calculated.

Based on the above population and the design criteria of 35 to 40 seconds average interval between lifts leaving the main lobby and 5 minutes handling capacity of 12% of total population, seven lift zones with four lifts per zone were required. However, because of the inherent constraint of the triangular core, it was not possible to accommodate all the 28 passenger lifts and two service/fireman lifts all the way up from the main lobby on second floor to their destination with reasonable usable floor area efficiency. To improve this, reducing the number of lifts shafts originated from the main lobby was worth considering. Sky lobby concept would be the solution.

Sky Lobby Concept - it divides the building vertically into two zones, each of which will be served by different groups of lifts, that is four groups for low zones and three groups for high zone with four lifts per group. An extra main lobby, the sky lobby, was introduced at 46/F to serve the floors above by local zone lifts. The communication between the sky lobby and the main lobby will be via five non-stop express shuttle lifts having a speed of 8 m/s.

With the adoption of sky lobby concept, seven lifts shafts are saved all the way from the main lobby on second floor to 46/F. This substantially improves the efficiency of the building by adding 80 m² more usable floor area to each low zone floor. At a capital value of HK\$5,000 per ft², the developer would mean a gain of HK\$4.3 million per floor. So, the proposal for having the sky lobby is easily justified. As a result of this arrangement, the overall efficiency of the building is over 81% for a single tenant.

In addition, escalators serve as the main link between ground floor, first floor and the main lift lobby on second floor. A total of 39 lifts and 6 escalators are adopted and provided for Central Plaza.

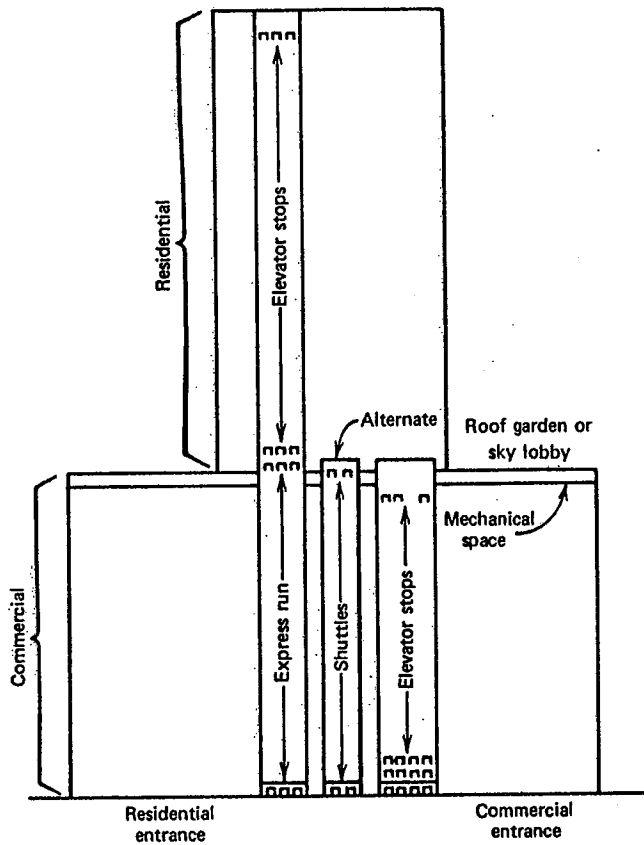


Figure 14.1. Multipurpose building—office and residential.

The sky lobby concept has been a successful approach to the office-apartment combination. A separate lobby is located on the lowest apartment floor and connected to the street by shuttle elevators. Apartment tenants ride these elevators to the sky lobby and change to the local elevator, which takes them to their floors. The sky lobby is enhanced by swimming pools, shops, or a restaurant. This is the elevating arrangement of the John Hancock Center in Chicago, where 44 floors of apartments are located above a 40-story office, store, and garage building (Figure 14.2).

Water Tower Place, also in Chicago, combines stores on the lower levels surrounding an atrium, which includes three observation-type elevators in glass hoistways, office space above the stores with separate elevator service, and a luxury hotel with a sky lobby above the office space. A third similar-type building is planned in the same area.

A hotel with extensive convention facilities, such as ballrooms and meeting rooms often used by others than the hotel guests, can be considered as a multipurpose building. Separate vertical transportation for outside guests increases the value of the meeting facilities and minimizes their interference with hotel guests. Guests, even when they are attending the meeting room functions, appreciate the reduced congestion on the main passenger elevators.

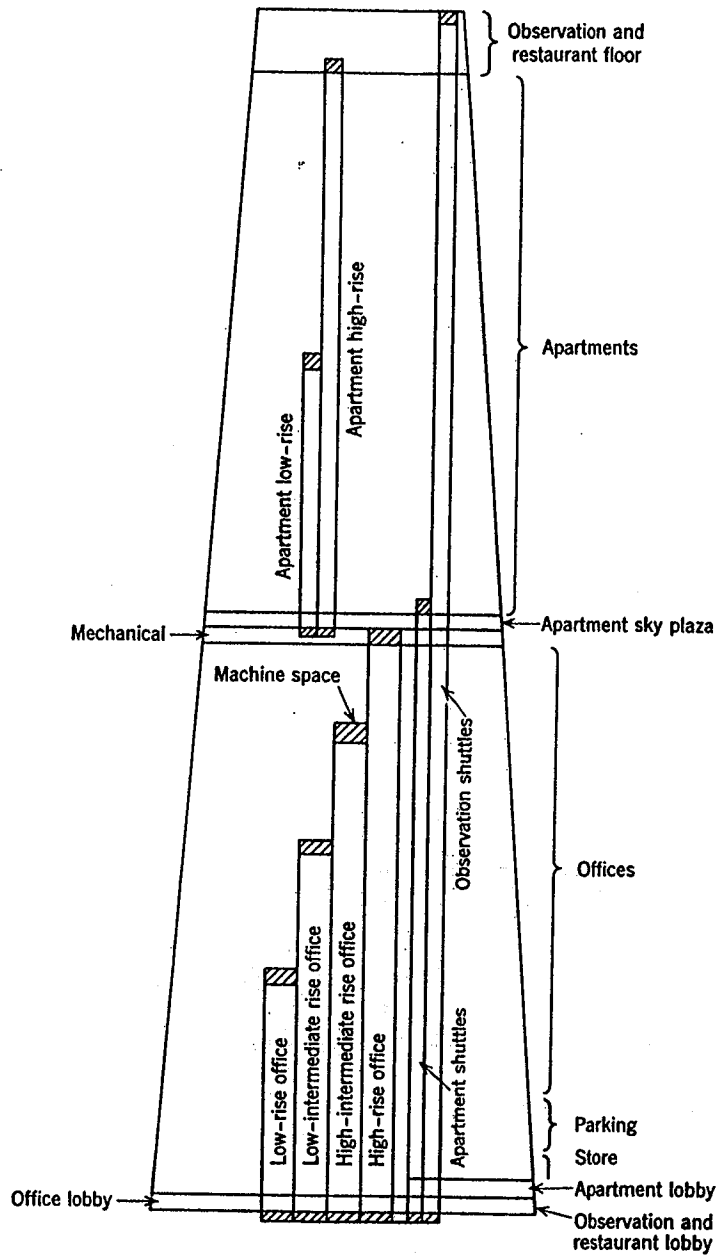


Figure 14.2. John Hancock Center, Chicago.

In estimating the vertical transportation requirements of the separate functions in a building, the expected maximum usage of each facility and the possible time of use of each must be considered. If periods of maximum use do not overlap, it may be possible to combine functions, and the vertical transportation is calculated for the maximum use. In addition to the quantity of service required, the nature of the traffic must be determined. Its direction is either in unison or opposed, and proper elevator provisions must be made.

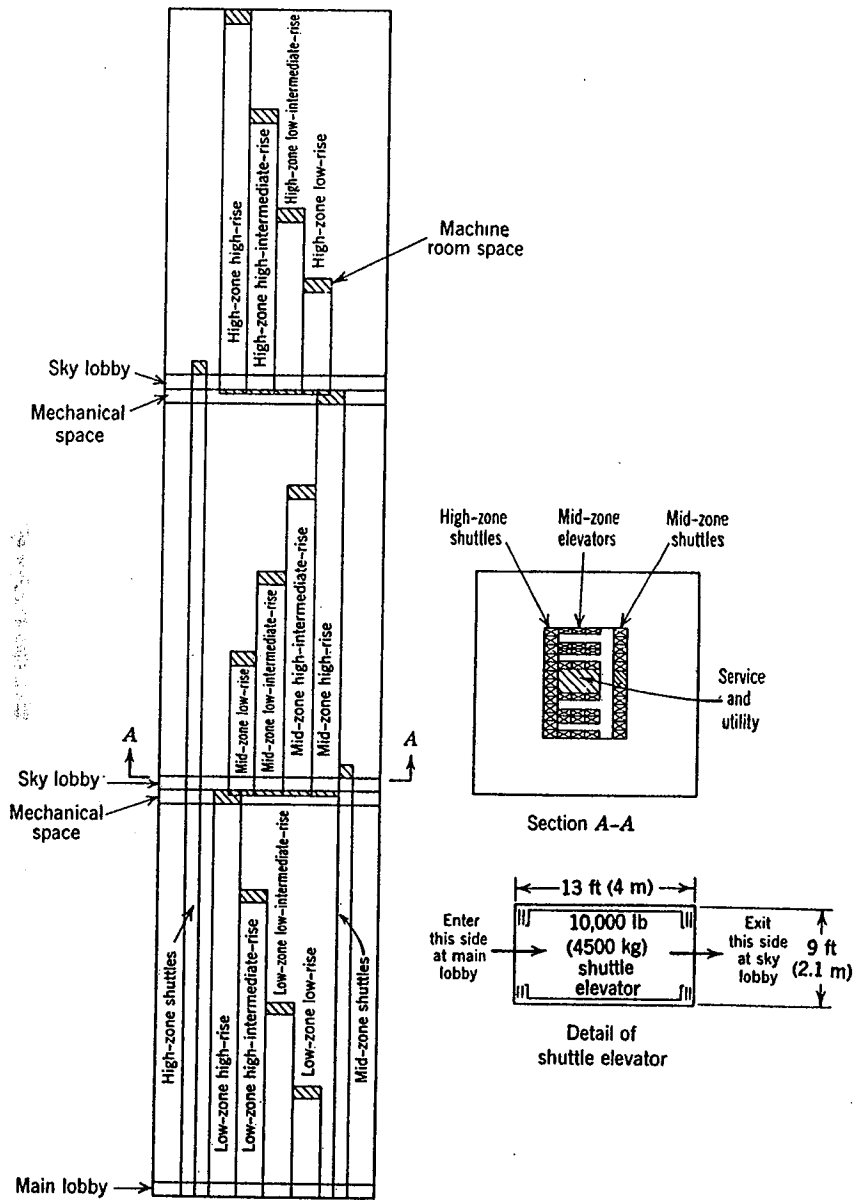


Figure 14.3. World Trade Center, New York.

DOUBLE-DECK ELEVATORS

Operation

Another approach to reducing the space required by elevators in taller buildings is the use of multideck or compartment elevators. Here the upper and lower decks of each elevator are loaded simultaneously (during the incoming rush, for example), with passengers destined for the odd-numbered floors entering the bottom deck and those for the even-num-

bered floor used with a level (Figure serving each from both sides. This results in times. If the made unre any floor s After of operative a an up trip : this way ac and a car c and people entering th

Brief Hist

Although Otis instal tems can t Building, 1 950 feet a and the thi deck oper Streets. Th Pearl Stre

Design 2500/2500 sides of th street lob floors. Six ft. 0 in.; ca

The do lower-dec the main l four at oc floors, the cabs stopp ger enteri

The do double-de hours. Du start only the full " ment was els. The e

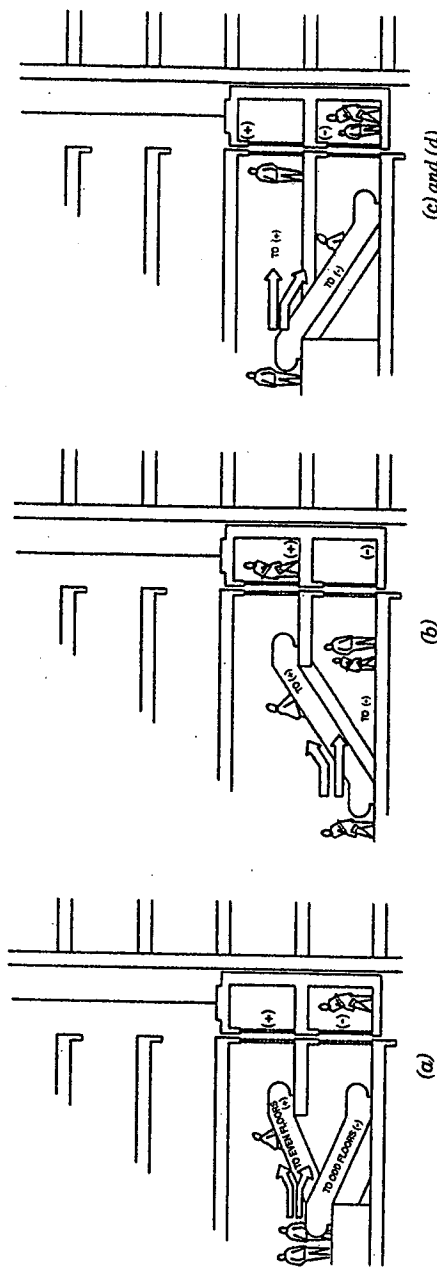
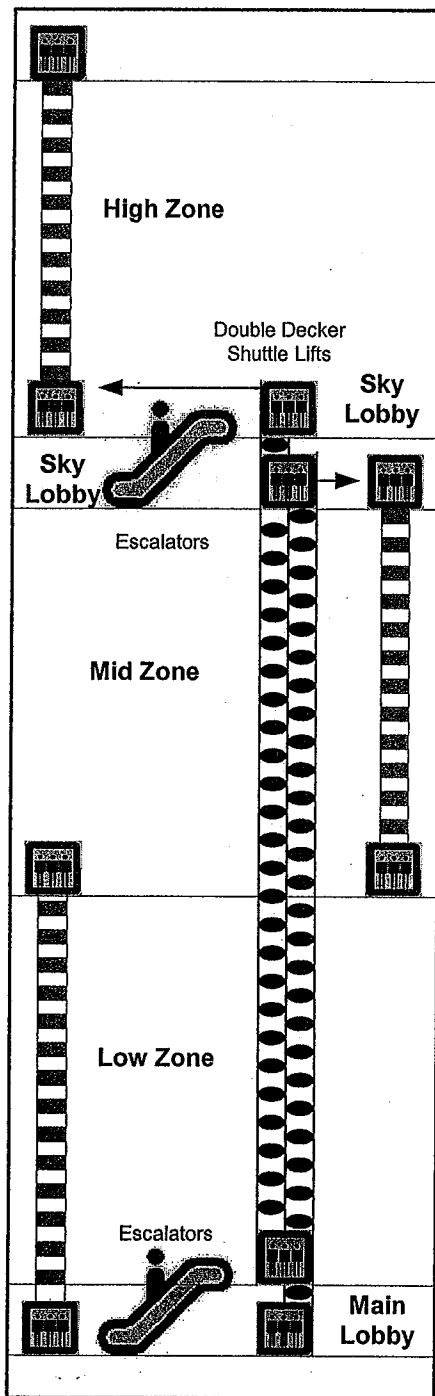


Figure 14.4. Typical double deck dual-loading lobby arrangements: (a) dual entry/exit lobby serving each level. (Note: + represents even numbered floors, - represents odd numbered floors.) (b) split-level lobby; (c) main lobby at the lower level; (d) main lobby at the upper level;

A speak operators t
 vided to es
 gency. Eac
 was provid
 In the a
 Smith, ope

Schematic of Sky Lobby Scheme:



Performance of the conventional scheme:

	Low Zone	Mid Zone	High Zone	Shuttle Lift
Levels served	1, 7-19	1, 22-33	1, 36-47	1, 48-59
Total population	1250	1008	810	720
Lift car no. per zone	6	6	6	6
Lift speed (m/s)	3.5	5.0	6.1	7.1
Lift car load (kg)	1600	1600	1600	1600
RTT (seconds)	169.4	168.3	162.9	161.3
AI (seconds)	28.2	28.1	27.2	26.9
HC (%)	14.9	12.9	13.9	13.4

* Level 20, 21, 34, 35 are mechanical/refuge floors.

	Area of lift shaft+lobby per floor (m ²)	No. of floor passing through	Total area (m ²)
Low Zone	102	18	1836
Mid-Low Zone	102	30	3060
Mid-High Zone	102	42	4284
High Zone	102	54	5508
		TOTAL =	14688

Performance of the sky lobby scheme:

	Low Zone	Mid Zone	High Zone	Shuttle Lift
Levels served	1, 7-20	37, 23-36	38, 41-59	1, 2, 37, 38
Total population	1428	1302	1267	2569
Lift car no. per zone	6	6	6	6
Lift speed (m/s)	3.5	3.5	3.5	3.5
Lift car load (kg)	1600	1600	1600	1600
RTT (seconds)	173.3	145.4	172.1	137.5
AI (seconds)	28.9	24.2	28.7	28.5
HC (%)	14.5	14.9	12.6	15.8

* Level 21, 22, 39, 40 are mechanical/refuge floors.

	Area of lift shaft+lobby per floor (m ²)	No. of floor passing through	Total area (m ²)
Low Zone	102	19	1938
Mid Zone	102	15	1530
High Zone	102	20	2040
Shuttle Lift	102	37	3774
Sky Lobby	Area = 600	2 floors	1200
		TOTAL =	10482

Notes: RTT = round trip time (seconds); AI = average interval (seconds); HC = handling capacity (%).

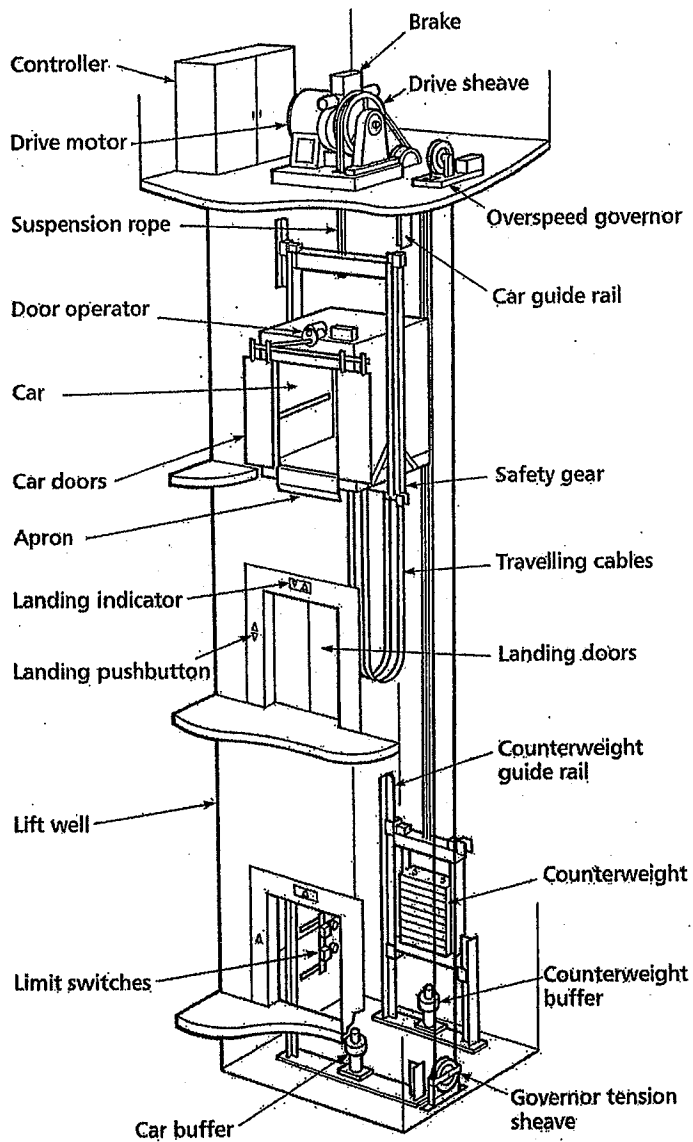


Figure 7.1 Electric traction passenger lift — principal components

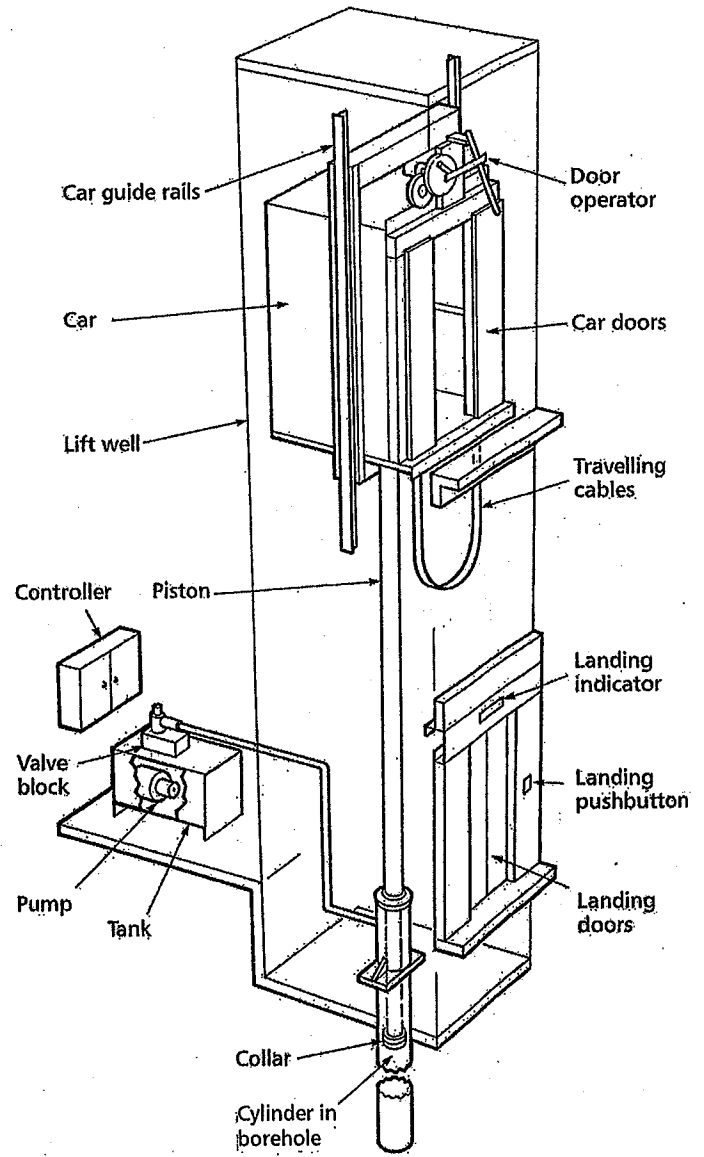


Figure 7.2 Hydraulic passenger lift — principal components

[Source: CIBSE Guide D — Transportation systems in Buildings]