LINGAYA'S VIDYAPEETH
choose to know

Subject: Advance Services

Topic: Elevators

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ELEVATORS

BUILDING SERVICES

SERVICES

ELEVATORS

LIFTS

- The upward and downward moment of people in newly erected multistorey buildings is achieved by lifts.
- In large multistory building it is usual to look at the lifts at a central pedestrian circulation point.
- Lift position should be such that it does not obstruct the main entrance to the building and adjacent to the principle staircase.
- Area allowed varies from 0.14- 0.28 sq mper person.
- Speed of a car in a block of flats may not exceed 30 mper min.
- For a block of officies of not more than five stories the speed may be from 37 to 60 sqm per min.
- For a multistory departmental store with aresturant on the top floor, speed of 90 to 120 sq mper min.
- Speed of goods lift may be as slow as 24sqm per min.
- The following max. loads are stipulated for passengers lifts in blocks

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400kg(small lift) for use of passengers with hand baggage.
630 kg(medium lift) for use with prams and wheel chairs.

1000kg(large lift) can accommodate stretchers and furniture etc.

For a lobby in front of a single lift:

- the available min. depth b/wthe wall of the lift shaft and the opp. Wall must be atleast the same as the depth of the lift car itself.
- the min. area available shud be atleast the sam,e as the product of the depth of lift car and the width of the shaft.
- Lift enclosures should be of fire resistanting atleast equal to that of staircase.

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CAR FRAME: the supporting frame to which platform of lift car, its safety gear, guide shoes and suspension ropes and cables are attached.
CAR PLATFORM: the part of lift car which forms the floor and directly supports the load .
CONTRACT SPEED : the mean of max. speeds attained by car lifts in the upward and downward directions with rated load in lift car.
CONTROL: the system governing starting, stoping, direction of motion, acceleration, speed and retardation of moving members.
LIFT DOORS:
CENTRE OPENING SLIDING:
A door which slides horizontally and consists of two or more panels and open from center and are so interconnected that they move simultaneously.
DOOR SINGLE SLIDE:
DOOR SWING: opens mutually and closed by means of spring closer.
FLOOR: the lower surface in a stored of which one normally walks.
GUIDES: members used to guide the moment of lift car or counter weight in the vertical direction.
LANDING CALL PUSH: A push button fitted at the lift landing either for calling the lift car or for actuating the call indicated.
LANDING DOOR: the hinged or sliding portion of a lift well enclosure controlling access to the lift car at the lift landing.

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LIFT CAR: the load carrying unit with its floor or platform car frame and enclosing body work.
LIFT LANDING: the portion of the building or a structure used for reception and discharge of passengers or goods and both into or from a lift car.
LIFT MACHINE: part of the lift equipment comprising motors the control gear, reduction gear, if any and the winding drum (sheave) by which lift car is raised or brought down.
LIFT PIT: space in the lift well below the lowest lift landing serve.
LIFT WELL: unobstructed space within an enclosure provided for vertical moment of lift cars or any counterweight including lift pit and space for tyop clearance.
LIFT WELL ENCLOSURE: any structure which separates lift well from its surroundings generally of r.c.c.
THE LIFTING BEAM: mounted immediatlly below the machine room ceiling to which lifting tackle can be fixed for raising parts of lift machine
RATED LOAD: max. load which the lift car is designed for and installed to carry safely at its rated speed
RATED SPEED :speed attained by lift or elevator in the upward direction with rated loads in lift car
SUSPENSION ROPES OR CABLES : ropes by which car and counter weight are suspended .
COMPENSATING CABLES: cables which connects the counter weight and lift car
TRAVEL: vertical distance b/wbottom and top lift landing which are served by elevators

or lifts .

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TYPES OF LIFTS
Lifts can be classified according to there use
Passenger lift
Hospital or bed lifts
Goods or freight lifts
Service lifts or dumbwaiters

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PASSENGER LIFTS

Passenger lifts are meant for vertical transportation of human beings. These are further classified as:

A} Low and medium class flats: one lift is required to carry four passengers. Car speed should not exceed 0.5 mper sec

Lift cars and landings should be provided with solid sliding door preferably automatic closing type. For avoiding danger of the door being left for unsocial persons. Such lifts should be near the staircase or may be provided in shaft adjoining the building. B} Office buildings, hotels and high class flats: selection of lifts for installation in these buildings is done on the bases of assessed or actual building population, flow of passenger traffic, quantity and quality of services

Methods of operation

Car switch /handle operation

Automatic push button operation

Group supervisory control

Selective collective group operation

Signal operation

Dual operation

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CAR SWITCH /HANDLE OPERATION
Suitable for large buildings having heavy traffic, which needs to be controlled through operators. doors has to be collapsible types .
AUTOMATIC PUCH BOTTON OPERATION
Recommended for small office buildings and hotels having a single lift
SELECTIVE COLLECTIVE GROUP OPERATION
Most suited in public office building doors should be automatic power operator

GROUP SUPERVISORY CONTROL
Inevitable in high rise buildings having sophisticated business medium and large traffic
SIGNAL OPERATION
Attendant responds to traffic by signal from flag indicator
DUAL OPERATION
With or without attendant.

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HOSPITAL BED LIFTS

Rated load of lift should be equal to passenger lift of same car area to avoid risk of serious overloading in general hospitals.

Speed of 0.5 m/sec is recommended for small hospitals.

1 m/sec may be desirable in long travel cases and 1.5 m/sec in case of high-rise hospitals.

Two speed sliding doors are recommended with automatic closing /opening device and micro leveling.

Doors may be collapsible type in narrow lifts.

The lift shaft shall be situated as near as possible towards operation theatre for which they are meant.

SERVICE LIFTS [DUMB WAITERS]

Slow speed mini lift to handle only material for transportation [vertical] from 100 to 250 kg.

Speed varying from 0.25 m/sec to 0.5 m/sec.

Only two types of controls call and send and multibutton controls are used.

Gate opening may be at front or rear and doors are always half splitting type.

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GOODS OR FRIEGHT LIFTS

Goods lifts with speed of 0.25 to 1 m/sec are available in loads varying from 500kg to 5000kg.

Car floor area < 0.8 sq m, payload > 300kg.

The shaft framework is normally made of steel sections set in the shaft pit or on the floor and clad on all sides by non-flammable building materials.

Lift motor room must be lockable, have sufficient illumination and be of a size that maintenance can be carried out safely.

The height of the area for the lift motor > 1.8 m.

Closed spaced mid – bar collapsible multi-leaf metal doors should be provided in the car and at each entrance.

Large special purpose goods lift may be equipped with power operated vertical sliding doors.

An external push-button control must be provided for calling and dispatching the lift to/from each stopping point.

For food lifts in hospitals, the lift shaft must have washable smooth internal walls.

Accuracy of stopping: for goods lifts without deceleration = 20-40 mm.

For passenger and goods lift with deceleration = 10-30 m.

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HYDRAULIC ELEVATORS

These elevators meet the demand for transporting heavy loads economically up and down.

Appropriate for low rise structures.

Best used for upto 12m lift height.

The operating speed of hydraulic lifts is 0.2-0.8m/sec .

In these elevators ,a piston goes up and down alongwith the lift .

Standarddirect acting piston lifts can be used to lift payloads of as much as 20 t upto a maximum height of 17m.

Standard indirect acting piston lifts can lift 7t upto 34m.

The lift motor room can be located remotely from the shaft itself.

Among the several variations in hydraulics, the most commenly used is centrally mounted ram.

Height clerance of the lift doors should be 50-100mm.

Double swing doors or hinged sliding doors can be fitted either hand operated or fully automatic,with a central or side opening.

It has electrically controlled balls to release the oil from the cylinder to control the descend of lift.

Leak oil proof covering.

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PANORAMIC GLASS LIFTS

Panoramic lift enjoys great popularity.

This applies both to external lifts on the facades of imposing business premises from which passengers can enjoy the view and internal lifts in departmental stores or in foyers of large hotels.

Panoramic lifts are available in a variety of cabin shapes which may be octagonal,hexagonal,semi-circular,circular,u-shaped etc .

There are several possible drive systems and nominal speeds,depending on the height of building and requirements for comfort:0.4,0.63,1.0m/sec with a a 3 phase a.c drive and 0.25 -1.0 m/sec with a hydraulic drive .

Construction materials used are glass and steel-polished,brushed or with high gloss finish-brass and bronze.

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ELEVATORS FOR DISABLED

In multi-storey building elevators are principal means of vertical circulation for those confind to wheelchairs and for others with difficulty in walking.

Minimum dims of elevator car to accommodate standard wheelchair:1100 internal depth, 900width , 700 clear door opening.

In public building there should be sufficient space for another person to accompany chair-bond:1400 min. width, 1100 width.

In special residential homes large wheelchairs are to be accommodated; dimensions:1800 depth ,1000width, 800 door opening.

Elevator cars must be accurate in leveling and at landings.

Photoelectric devices in doors to prevent premature closing desirable .

Control buttons should light to operate .

Mean height should be 1400 max 1600

To position wheel chairs there should be clear space at least 1500 x 1500 before each lift door.