Standards for Elevators

Acceptable Standards

Must have

Particulars	Handling Capacity		Average Waiting Time (AWT)	Nominal Travel Time (NTT)	Interval
	Existing	Revised			
Luxury	5%	>8%	⩽30	25 – 35	⩽60
Premium	5%	6%	31 – 45	36 – 45	61 – 80
Aspi	5%	6%	31 – 45	36 – 45	61 – 80
Casa	5%	5%	46 – 60	46 – 60	81 – 100
Crown	5%	5%	46 – 60	46 – 60	81 – 100

1. All elevators shall be equipped with device (e.g. Automatic Rescue Device -ARD) enabling lift to stop at next floor, in case of emergency / power failure etc. ARD shall have electronic sensing to function during power failure including single phasing. It shall be provided with sealed maintenance free battery and shall have battery low / fault warning indicators and interlocks.
2. In case of lifts with speeds more than 1.5 m/s, explicit discussion will be held with HVAC / MEP consultant as to how to maintain the Lift Machine Room (LMR) to the desired temperature of the manufacturer specification (generally - 40°C). The machine room of Elevators with speed upto 3mps shall be provided with exhaust fans and rest all elevators machine rooms shall be provided with AC.
3. In all buildings having height greater than 30 meters, at least one elevator should be capable of handling a medical stretcher and shall be designated as 'fire lift'. Further, if building height is > 60 m, such stretcher/fire lift elevator should be in separate fire lobby (can also be service lobby) and the said fire lift should be accessible from

external face of building (either lift is on accessible face of building or within 5 m distance from external face with straightforward access from the external face with clear signage on ground level) This can be achieved by having any one of the following minimum dimensions in any one of the lifts (not necessarily service lift):

a. Min Depth of cabin: 2100 mm;
b. Minimum door opening size of 900mm & min. width of 1100 mm.
c. Weight handling capacity:
    i. 30-60 m – min. 544 kg
    ii. >60 m – min. 1000 kg

4. Sizing of lift shafts during design phase:
    a. In all buildings with height greater than 150 metres, a Grade A elevator consultant is to be appointed. This elevator consultant is expected to provide the shaft dimensions (such that it could accommodate the lifts of a reasonable no. of manufacturers, not necessarily all) and lift pit depths.
    b. In buildings less than 150 meters, the shaft dimensions should be taken by taking the smallest possible dimensions, which would accommodate the lifts of 3 leading manufacturers. Oversizing of the shafts is to be avoided since it leads to increased construction costs, loss of space and issues with installation. Significant thought needs to be put prior to the sizing of the shafts.
    c. It is to be noted that construction tolerance is already built into the required shaft sizes specified by manufacturers. If building height is greater than 150 meters, the shaft dimensions specified by the Consultant, as per a) above would take into account any need for additional tolerance due to increased building height.
    d. In case of more than one lift being located adjacent to each other, the shaft can be shared if the lifts are not fire lifts. The shaft dimension is calculated by taking the individual shaft dimension required for each lift + a 200 mm thickness between each lift for installation of steel beams OR RCC beams.
    e. The shaft of a fire lift has to be isolated – this can be done by using RCC beams + blockwork & plaster (for buildings <= 70 m) and full RCC walls for buildings >= 70 m.
5. Prior to finalization of lift tender specifications, the security systems should be reviewed by Project Architect + Project Engineer and any required items to be

incorporated into lift from security perspective should be done eg. Cameras, access control features card, biometric etc. (Refer MEP policy # 20)

6. The floor nos in the lifts should be strictly as per the 'Floor Numbering' provisions of the Floor Numbering Policy (as may be amended from time to time).
7. The population for purposes of determining lift speed / capacity should be calculated as per the company's 'Occupancy Factor norms'. Please note that wrt passenger elevators, 'domestic help' population is NOT to be considered and wrt service elevators, 'owner occupant' population is NOT to be considered.
8. In Excelus and iThink office developments with large populations and concentrated peaks, to improve performance, destination dispatch / similar systems (2018) are to be considered at time of concept design. Such system is to be considered, but not mandatory, for Supremus office developments.
9. It is clarified that:
    a. All lifts in the main building which are part of the passenger lift lobby will be treated as passenger lifts, irrespective of depth/size. Generally, all lifts in a passenger lift lobby need to be coupled / combined together for purposes of call response.
    b. In other words, for a lift to qualify as a service lift, it needs to have a service lift lobby separated by a door from the passenger lift lobby. Such a service lift cannot be coupled / combined with the passenger lifts for purposes of call response.
    c. A service lift is not always a stretcher lift. Generally, a service lift serves dual purpose as the stretcher lift in buildings > 30 m.
10. Cabin Sizing related guidelines:
    a. Generally in office buildings, the 5% handling capacity becomes the critical factor and hence, using passenger elevator with large handling capacity is needed. It is recommended to use 20 passenger (1360 kgs) in office buildings.
    b. Generally in residential buildings, the waiting interval becomes the critical factor and added cabin size does not help lift performance. Hence, using smaller cabin sizes viz. 10-13 passengers (680 – 884 kgs) is recommended.
    c. In multi-storeyed retail developments, it is recommended to use passenger lifts with speeds not exceeding 1.75 m/s and having 10-16 passenger (680 – 1088 kgs) cabins.

11. Cost related guidelines:
    a. Lifts costs increase significantly at following intervals:
        i. Low: Upto 1.75 m/s
        ii. Medium: 1.75+ m/s – 2.5 m/s
        iii. High: 2.5+ m/s - 4 m/s
        iv. Very High: 4+ m/s
    b. We should avoid going from one category to other, if feasible but within a given category, lift performance levels should be most important in the decision wrt the speed.
    c. 2 m/s is a non-standard speed and generally means using the 1.75 m/s machine with some extra performance.
12. Brand-guidelines:

    There are three categories of brands:

    a. MNC – Reputed manufacturers having strong reputation for technical competence, safety and execution. Permissible (not necessary) for all project segments, except Boulevard Retail.
    b. Local I – Top 3 India-only manufacturers, who have strong reputation for technical competence, safety and execution eg. Omega/ Victoria: Permissible for Casa Residential, Boulevard Retail, Experia Retail Buildings & Schools + Permissible for service (not stretcher passenger) elevators and car park elevators in all type of buildings. (note: For car park elevators, if interior finishes are a concern, bare shell lifts can be taken and interiors upgraded)
    c. Local II - 2nd tier India only manufacturers, other than those in Top 3 e.g. Escon, Hallmark who have decent quality and safety reputation: Permissible for buildings which are not going to be run by Lodha in the long run e.g. PPL/GCP, MMMDA rental building, tenant only buildings in SRA/MHADA etc.
    d. Non-passenger elevator (Eg. Fire or service) to be local manufacturers.
    e. MLCP & transfer elevators should be treated as passenger elevators – wrt manufacturer and finish.

    All above are subject to technical competence and past experience of the said brand for the building under consideration.
13. Earthquake Safety Requirements:
    a. For buildings in earthquake zone 1 or having height <= 150 m (or height < 70 m in luxury residential, high end residential or Excelus office) in earthquake

zone 2, no additional measures are required to be taken for strengthening of rails or for sensing earthquake.

b. For buildings having height > 150 m (or height > 70 m in luxury residential, high end residential or Excelus office) in earthquake zone 2:
    i. Earthquake sensor (one + one backup) shall be installed which will instruct & enable all lifts to stop at next floor in the event that an earthquake is detected.
c. For building in earthquake zone 3 or higher, relevant ASME standards are to be followed.

14. Other technical requirements:
    a. The floor level of the lift opening on any floor should be slightly higher (10-15 mm) than the rest of the lobby to prevent water ingress into the lift shaft. The slope can be taken in the last flooring member OR if same is not feasible, a threshold patti outside the lift door will need to be incorporated.
    b. The Weight of the finishing** shall be considered and informed to the vendors at the time of procurement if lift is being ordered as bare shell.
    c. The Lift machine room air conditioning / ventilation requirement shall be clarified and incorporated in the MEP tender (please see pt. 2 above).
    d. The Shaft lighting & Power shall be put in Lift vendors scope and MEP Vendor shall incorporate the power requirement for the same. This supply shall be separate from Lift's main supply.
    e. The air relief opening requirement for the lifts of 2.5 m/sec and above shall be confirmed and opening on top and bottom shall be coordinated with the structural engineer. However if the pressure relief openings are coming on the habitable floor than their location and acoustic impact shall be evaluated. All pressure relief opening shall be provided with a suitable size fire damper to prevent propagation of fire through shafts.
    f. Once the interior design of the car has been finalized than same shall be shared with the lift vendor to check if it has any impact on the ventilation.
    g. Where we have more than one lift in a common shaft than the separator beam shall be included in the lift vendor scope.
    h. If there is a habitable area below the lift pit, then the same shall be provided with counterweight safety device.

i. Lift electrical controls shall be provided with over voltage / under voltage / single phasing / phase reversal / voltage unbalance / over & under current / ARD battery low protections which are required to ensure ARD operation and safety of passengers at all times.

j. All express zone elevators shall have emergency opening at every 2nd or 3rd floor (max. 11 m landing to landing as per NBC V2, part-8, Section-5, clause 6.1.1C, P-40) from previous landing. These emergency openings are meant for evacuation due to any failure of the lift midway in the express zone.

k. When lifts are travelling in the express zone and there is a power failure event, then the operation logic shall be as follows:
    i. If the lift is lightly loaded (<= 50%) then the lift shall travel up and stop at the first landing of its zone
    ii. If the lift is heavily loaded (> 50%) then the lift shall travel to the P0(entrance lobby floor)
    iii. Even if the power supply returns during this time, the ARD shall complete its operation and then switch over to the normal supply.

l. All elevators to have intercom/equivalent system for emergency and CCTV inside elevator. These are to be monitored at central control room in development.
    i. INTERCOM - In large projects where the lift intercom system cannot be directly taken to the central control room, the lift intercom system should be integrated with the project IP intercom system, same to be clarified during bidding stage with vendors.
        1. Option 1 - Vendor to provide an IP based intercom which can work with the SIP exchange
        2. Option 2 - Vendor is introduced to M/s Technic/Equivalent (analogue intercom - rate carded at Palava) for integration in his car, and a connection is made through a voice gate-way connected to the FTTx system.
        3. Tendering engineer to ensure coordination between Lift and ELV packages
    ii. CCTV – Cable from lift camera upto the Lift Controller shall be in the scope of the Lift vendor, and in buildings taller than 90m the cable shall be fiber optic.

m. Lift car ventilation – Ventilation fan capacities for lift cars shall be as follows:

Capacity (no. of passengers)	**Fans CMH***
Up to 10	350
13 - 17	350 x 2
20 - 26	600 x 2

*flow rate mentioned above shall be achieved at the grill.

15. For elevator cabin and door sizing and finishes, see '*Guidelines for elevator Interiors*' (Design ID policy #145).

16. In case of Experia retail and all offices, all non-service lifts should have screen for 'live TV' and 'advertising'. The TV is to be set to appropriate channel (business news eg. CNBC, Bloomberg or high quality general news eg. CNN) and with English subtitles (since on mute). Screen can be multi-use eg. To display tenant name, floor no. etc.

17. For passenger lifts installed in super high rise buildings (height > 150 m), the floor buttons inside lift (if applicable) should be replaced by control pad so as to reduce the no. of buttons and size of control panel inside the lift.

18. Swing type COP panel to be mandatory instead of the standard COP panel to avoid any gap in the COP & the ceiling. Procurement/MEP/AD/ID to take note of this during tendering stage.

19. Lift monitoring system to be provided to monitor information on RTT, Interval, Avg. waiting time, Data log as per below project category:-

		LMS required	Remarks
Residential	a) Premium Plus	Yes	
	b) Premium		
	c) CASA	No	
	d) CROWN	No	
Office	a) Excellus	Yes	
	b) Supremus /Ithink	Yes	
	c) Signet	No	
Retail	a) Experia	No	
	b) Boulevard (if > 1 floor)	No	

20. Car lifts:

Should be avoided as far as possible and ramps should be used. Where necessary, following norms shall apply:

a. Should be used to serve <= 5 levels (including entry level + max. 4 additional levels) AND <= 200 nos. of parking slots.
b. Should be capable to handing vehicles with weight upto 2500 kgs in hi-end and luxury projects (and Excelus & Supremus office where located in the (micro) markets that have hi-end and luxury projects) and 1800 kgs for other projects. Please note that this vehicle weight excluding the weight of the lift cabin.
c. Finishes shall be as follows:
    - Door Height – 2.1 m
    - Cabin Height – 2.4 m
    - Luxury/Hi-end(/Excelus & Supremus in same market):
        - Interior – SS; Doors – SS on entry level, MS Powder coated on all other levels
    - Other Developments:
        - Interior – MS Powder Coated; Doors – SS on entry level, MS Powder coated on all other levels

21. For all town ship projects MRL to be used as prevalent in current condition. All other projects wherever aviation height restriction is not there WMR can be proposed as per architectural intent.

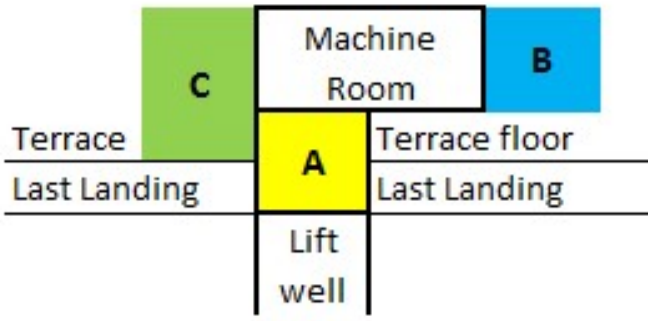
22. Whenever WMR lifts are selected the maximum permissible height above the terrace shall be as per the table below – MEP and Architecture teams will aim to minimize the height below these maximum limits:

Roof to Machine Room Top level details for various speed and sizes of lifts

Rated capacity	Building FTF Height - mm	Elevator Cabin Height - mm	Speed - 1.5 m/s			Speed - 1.75 m/s			Speed - 2.5 m/s		
			Elevator Overrun - mm	Machine room height - mm	**Height above Terrace Level - mm**	Elevator Overrun - mm	Machine room height - mm	**Height above Terrace Level - mm**	Elevator Overrun - mm	Machine room height - mm	**Height above Terrace Level - mm**
			A	B	C	A	B	C	A	B	C
Residential - CASA											
680	3000	2300	4700	2500	**4200**	4700	2500	**4700**	N/A	N/A	N/A
884	3000	2300	4700	2500	**4200**	4700	2500	**4700**	N/A	N/A	N/A
1020	3000	2400	4800	2500	**4300**	4800	2500	**4800**	5400	2500	**4900**
Residential - ASPI											
680	3150	2400	4800	2500	**4150**	4800	2500	**4800**	N/A	N/A	N/A
884	3150	2400	4800	2500	**4150**	4800	2500	**4800**	N/A	N/A	N/A
1020	3150	2400	4800	2500	**4150**	4800	2500	**4800**	5400	2500	**4750**
Residential - HI -END/LUXURY											
1020	3600	2800	5200	2500	**4100**	5400	2500	**4300**	5800	3000	**5200**
1150	3600	2800	5200	2500	**4100**	5400	2500	**4300**	5800	3000	**5200**
1360	3600	2800	5200	2500	**4100**	5400	2500	**4300**	5800	3000	**5200**
EXCELUS/SUPREMUS /I-THINK											
1088	4050	2800	5200	2500	**3650**	5400	2500	**3850**	5800	2500	**4250**
1150	4050	2800	5200	2500	**3650**	5400	2500	**3850**	5800	2500	**4250**
1360	4050	2800	5200	2500	**3650**	5400	2500	**3850**	5800	3000	**4750**
1600	4050	2800	5200	2500	**3650**	5400	3000	**4350**	5800	3000	**4750**
1800	4050	2800	5200	3000	**4150**	5400	3000	**4350**	5800	3000	**4750**

Roof to Machine Room Top level details for various speed and sizes of lifts (Continued)

Rated capacity	Building FTF Height - mm	Elevator Cabin Height - mm	Speed - 3 m/s			Speed - 3.5 m/s			Speed - 4 m/s		
			Elevator Overrun - mm	Machine room height - mm	**Height above Terrace Level - mm**	Elevator Overrun - mm	Machine room height - mm	**Height above Terrace Level - mm**	Elevator Overrun - mm	Machine room height - mm	**Height above Terrace Level - mm**
			A	B	C	A	B	C	A	B	C
Residential - CASA											
680	3000	2300	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
884	3000	2300	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1020	3000	2400									
Residential - ASPI											
680	3150	2400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
884	3150	2400	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1020	3150	2400									
Residential - HI -END/LUXURY											
1020	3600	2800	5800	3000	**5200**	N/A	N/A	N/A	N/A	N/A	N/A
1150	3600	2800	5800	3000	**5200**	N/A	N/A	N/A	N/A	N/A	N/A
1360	3600	2800	5800	3000	**5200**	N/A	N/A	N/A	N/A	N/A	N/A
EXCELUS/SUPREMUS /I-THINK											
1088	4050	2800	5800	3000	**4750**	6250	3000	**5200**	6250	4000	**6200**
1150	4050	2800	5800	3000	**4750**	6250	3000	**5200**	6250	4000	**6200**
1360	4050	2800	5800	3000	**4750**	6250	3000	**5200**	6250	4000	**6200**
1600	4050	2800	5800	3000	**4750**	6250	3000	**5200**	6250	4000	**6200**
1800	4050	2800	6250	3000	**5200**	6250	3000	**5200**	6250	4000	**6200**

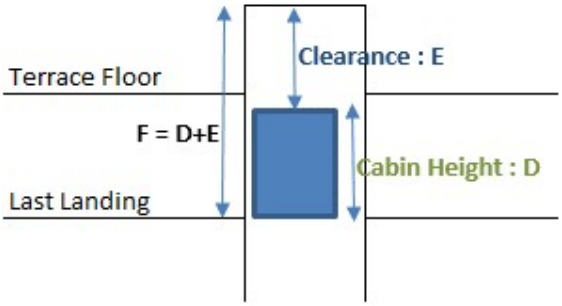


Slab thickness of 200-250 mm above the overhead shall be additional to the above dimensions.

23. Whenever MRL lifts are selected the maximum permissible heights of the overhead (dimensions from last landing) shall be as per table below - MEP and Architecture teams will aim to minimize the height below these maximum limits:

Overhead details for various speeds of MRL Lifts

Rated Speed	Cabin Height - mm	Clearance - mm	Height above Last Landing - mm
	D	E	F
upto 1mps	Refer	1900	F = D +E
>1mps to 2mps	item 13	2400	
2.5mps	of this	2600	
3mps	policy	2800	



24. Slab thickness of 200-250 mm above the overhead shall be additional to the above dimensions.
25. Fire alarm interface to be ensured for lift call system activation to bring all the elevators at ground floor upon confirmed fire signal from fire alarm panel. Pressurization fans to be set with 30sec delay after elevators reached at ground floor.
26. Sound/Noise performance for overall lift elevator are approx. 55dba outside the lift shaft, necessary study & provision to be done architecturally to reduce the noise level mostly in case of lift shaft abetting to bedroom or living room.
27. Lift M/C Drive to be selected with VVVFD drive with regenerative characteristic.
28. Lift M/C must withstand voltage variation not less than +10% and -15% without compromising the lift performance and safety.