# Standards for Elevators

**Acceptable Standards**

| Vertical | Segment | 5 minute Peak Handling Capacity (%) | Avg. Travel time (seconds) |
|---|---|---|---|
| Residential | Luxury | 5.00% | Upto 45 seconds |
| | Hi-end | 5.00% | Upto 45 seconds |
| | Aspirational | 5.00% | Upto 60 seconds |
| | Casa | 5.00% | Upto 75 seconds |
| Office | Excelus | 10.00% | Upto 45 seconds |
| | Supremus/ iThink | 7.00% | Upto 60 seconds |
| Retail | Experia | 7.00% | Upto 45 seconds |
| | Boulevard (if > 1 floor) | 7.00% | Upto 60 seconds |
| Parking Buildings (e.g. MLCP) | Any | 5% (if primarily serving residential user) / 7% (if primarily serving non-residential user) | Upto 60 seconds |

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. This can be waived in case of lifts with speed of 4 m/s or greater, provided appropriate mechanism for dealing with power failure is provided.
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 30° C )
3. In all buildings having height greater than 70 meters, at least one elevator should be capable of handling a medical stretcher. This can be achieved by having any one of the following minimum dimensions in any one of the lifts (not necessarily service lift):
    a. Depth of cabin: 1900 mm; OR
    b. Diagonal of cabin (using any combination of depth and width): 2100 mm, with minimum opening size of 900 mm & min. depth of 1500 mm.
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.)).
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. 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 necessarily a stretcher lift. Generally, a service lift serves dual purpose the stretcher lift in buildings > 70 m.

9. 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.
10. 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.
11. 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. Johnson: 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.

All above are subject to technical competence and past experience of the said brand for the building under consideration.

12. 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.

13. 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. In express zone (viz. normally no stops for the said elevator), emergency door shall be provided at every 11 meters. These doors shall be standard lift doors.
i. If there is a habitable area below the lift pit, then the same shall be provided with counterweight safety device.
j. 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.

14. Finishes of lift should be as follows:

| | **Passenger Lift*** | **Service Lift** |
|---|---|---|
| Luxury Resi<br>Hi-end Resi | Interior – Bare Shell**; Doors – SS;<br>Door Height – 2.4 m<br>Cabin Height – 2.7 m | Interior – MS Powder Coated (SS interiors may be considered for Hi-end and Luxury residential, Supremus and Excelus office);<br>Doors - MS Powder Coated;<br>Door Height – 2.4 m<br>Cabin Height – 2.7 m |
| Aspirational Resi | Interior – Bare Shell**; ; Doors – SS;<br>Door Height – 2.1 m<br>Cabin Height – 2.4 m | |
| Casa Resi | Interior – SS; Doors – SS on ground/main entry level and MS Powder Coated on all other levels;<br>Door Height – 2.1 m<br>Cabin Height – 2.4 m | |
| Experia Retail | Interior – Bare Shell**; Doors – SS;<br>Door Height – 2.1 m<br>Cabin Height – 2.4 m;<br>This does not cover any 'show / panoramic lifts, which shall be as per Designer's specifications | |
| Boulevard Retail | Interior – SS; Doors – SS;<br>Door Height – 2.1 m<br>Cabin Height – 2.4 m | |
| Excelus / Supremus Office | Interior – Bare Shell**; Doors – SS;<br>Door Height – 2.4 m<br>Cabin Height – 2.7 m | |
| iThink Office | Interior – SS; Floor – Customized Finis; Doors – SS;<br>Door Height – 2.4 m<br>Cabin Height – 2.7 m | |

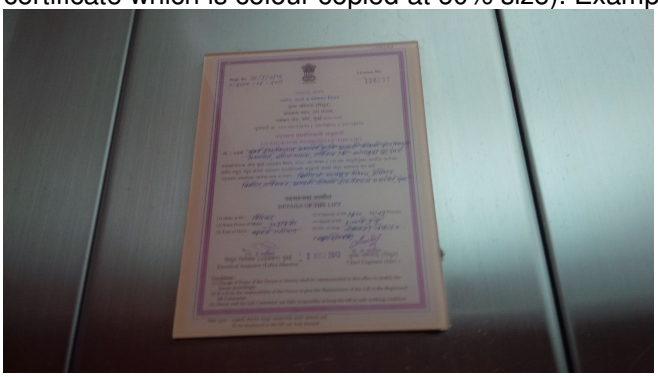
* All passenger elevators to have provisions for mirror. Also TV/equivalent installation displaying news and other relevant information, as well as acting as an advertising display medium, to be considered in passenger lifts for non-residential buildings if same if available at no/low cost through agency which manages it and makes money through the advertising potential.

** Interiors to be appropriately designed in floor, ceiling and sides by same interior designer who is handling the other Key Common Areas; piped music provision to be made; the weight of interior shall be 300 Kg for buildings < = 70 m high and for building > 70 m high, it shall be 500 Kg, in order to keep the weight of the lift reasonable and therefore, control motor and cable size/costs.
In case of Aspirational or Casa residential projects with specialist interior designers (alliances), the lift cabin (interiors and doors) shall be as per the standards for hi-end residential.

*** For MS interiors or doors, a scratch resistant coating / thicker paint which will reduce the amount of damage is to be used. Further, in those cases where interiors

are SS and Door is MS, attempt should be made to match MS paint finish colour with the SS.

15. All elevators should have provision (pre-provided frame – metal or acrylic) for installation of lift certificate. Size of the frame will be 5' x 7' (to be able to fit A4 certificate which is colour copied at 60% size). Example image below:



Reference image for lift certificate display with pre-provided frame at Mumbai International Airport 2015.

16. 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.

17. 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