Indian Standard

LIFTS FOR THE TRANSPORT OF PERSONS AND GOODS PART 7 LIFTS FOR SPECIAL APPLICATIONS SECTION 8 REQUIREMENTS OF LIFTS FOR PERSONS WITH DISABILITIES

व्यक्तियों और वस्तुओं के परिवहन के लिए लिफ्ट
भाग 7 विशेष अनुप्रयोगों के लिए लिफ्ट
अनुभाग 8 विकलांग व्यक्तियों के लिए लिफ्ट की आवश्यकताएं

Indian Standard

LIFTS FOR THE TRANSPORT OF PERSONS AND GOODS PART 7 LIFTS FOR SPECIAL APPLICATIONS SECTION 8 REQUIREMENTS OF LIFTS FOR PERSONS WITH DISABILITIES

FOREWORD

This Indian Standard (Part 7) will be adopted by the Bureau of Indian Standards after the draft finalized by the Lifts, Escalators and Moving Walks Sectional Committee had been approved by the Electrotechnical Division Council.

This draft Indian Standard is a part of series of Indian Standards on 'Lifts for the transport of persons and goods.' Other parts of this series of standards cover various requirements likespecifications for planning and selection, guide for inspection and maintenance of lifts, lifts for special applications, dumbwaiters etc. Parts 1, 2, 3 and 6 of this series of standards are being published as Indian Standards and other parts of this series are under development.

This standard specifies the minimum requirements for the safe and independent access and use of lifts by persons, including persons with disabilities in multi-storied buildings.
Requirements specified in this standard are in addition to those specified in IS 17900 (Part 1 & Part 2), as applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

This standard specifies requirements of lifts for accessibility for persons including persons with disabilities.

This standard specifies the minimum requirements for the safe and independent access and use of lifts by persons, including persons with disabilities mentioned in the Annex A, Table 2.
Requirements specified in this standard are in addition to those specified in IS 17900 (Part 1 & Part 2), as applicable.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

IS NO.	TITLE
SP 7 : 2016	National Building Code of India
17900 (Part 1) : 2022	Lifts for the transport of persons and goods : Part 1 Safety Rules
17900 (Part 2) : 2022	Design Rules, Calculations, Examinations and Tests of Lift Components

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 17900 (Part 1) and the following shall apply.

3.1 Accessibility — Accessibility in the context of this standard is the quality of a building or structure or a lift which enables all people irrespective of their age, gender or abilities, to access it and use its features equally and independently.

3.2 Disability — Disability in the context of a person: ‘Person with disability’ means a person with physical, mental, intellectual or sensory impairment which, in interaction with barriers, hinders his full and effective participation in society equally with others.

4 REQUIREMENTS

4.1 General — It is recommended that in multi-storied buildings, there should be at least one lift accessible to transport persons with disabilities at all usable levels. The requirements given below are to be considered and provided by building planners and building designers.

Such lift(s) shall be provided with the following building features:

a) Lift shall be located at accessible routes.

b) Accessible landings at lift entrance shall be provided on each eligible floors.

c) Lift shall be marked with international symbol of accessibility (*see* Fig. 1).

d) Directional signage indicating the location of an accessible lift shall be provided at a location that is clearly visible from the accessible building entrance. The directional signs shall incorporate a representation of the international symbol of accessibility (*see* Fig. 2).

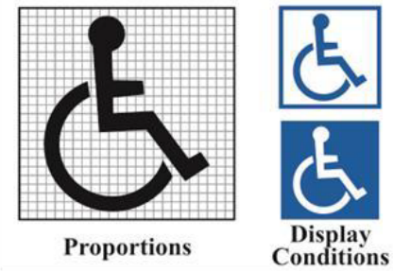

FIG. 1 INTERNATIONAL SYMBOL OF ACCESSIBILITY

FIG. 2 WAY FINDING SIGNAGE FOR LIFT LOCATION

e) A sign indicating the number of the floor arrived shall be provided on each lift landing on the wall opposite the lift in big font with colour contrast.

f) It is recommended to install a floor directory of the main facilities and services available on the lift landing, along with an accessible emergency exit route that clearly indicates the location of the nearest refuge area for persons with disabilities.

4.2 Entrances: Door Opening

4.2.1 Entrance clear opening shall be at least 900 mm. The doors shall be constructed as automatic horizontal sliding doors.

4.2.2 Obstacle-free accessibility on the landing floors is required on all eligible floors.

NOTE — Recommendations regarding landing free space in front of lift door are given in Annex B.

4.2.2.1 To allow users to enter and leave the lift unhindered, the door dwell time shall be adjustable from 3 s to 20 s.

> **NOTE** — The present time for a certain lift may be reduced by using the door closing button in the car or by other means. It is recommended that the time of closing of the automatic doors be more than 5 sec and door speed may not to exceed 0.25 m/s, but this may affect the traffic analysis and hence to be agreed mutually between manufacturer and owner.

4.2.3 A non-contact sensor device shall be provided in the door opening to detect an entering or exiting passenger or an assistive device to prevent the risk of the passenger or an assistive device from being hit by the leading door panel(s). The sensor device shall cover at least 1 600 mm of the door height measured from a distance of 25 mm above the door sill. If there is a user in the doorway, the door shall automatically reopen and shall not produce a force greater than 135 N.

4.3 Car Dimensions, Equipment in the Car, Levelling Accuracy

4.3.1 *Car Dimensions* — inside minimum dimensions of lift cars with single entrance or with two opposite entrances shall be chosen in accordance with Table 1.

TABLE 1 MINIMUM CAR DIMENSIONS FOR LIFT CARS WITH A SINGLE ENTRANCE OR TWO OPPOSITE ENTRANCES
(*Clause 4.2.1*)

Sl No.	Type of Unit	Minimum Car Dimensions	Accessibility Level	Remarks
(1)	(2)	(3)	(4)	(5)
i)	1	1500W x 1500D	This lift car accommodates one wheelchair user and several other passengers	Minimum Requirement for Public buildings
ii)	2	1900W x 1900D	This type allows full maneuverability of a wheelchair.	Recommended for Public buildings
iii)	3	1100W x 1300D	This lift car accommodates one wheelchair user and one other passenger	Minimum requirement only for Residential buildings

NOTES —

1. Shaft requirement for above lift cars are as specified in Annex C (***see*** also Fig. 7).
2. For the intent of this standard public buildings shall be malls, hotels, commercial buildings, hospitals, airports, institutional buildings, business, mercantile, assembly buildings, storage, hazardous, educational buildings, mix use buildings etc.
3. Residential buildings shall include any building in which sleeping accommodation is provided for normal residential purposes with or without cooking or dining or both facilities, except all those buildings mentioned in Note 2 above.

4.3.2 *Equipment in the Car —*

4.3.2.1 On both sides and rear of the lift car, handrails shall be installed which are slip resistant & with round ends. The gripping of this handrail shall have a circular section with minimum circumscribed diameter of 38 mm and a maximum of 50 mm. The free space between the wall and the gripping part shall be 40-60 mm from the walls; 40 min. for smooth wall surfaces and 60 min. for rough wall surfaces. Should be free of any sharp or abrasive elements. The height of the top edge of the griping part shall be within 800 to 900 mm from the finished car floor level. It should have continuous gripping surface without interruptions or obstructions. The handrail may be interrupted where the car operating panel is located in order to avoid obstructing buttons or controls and be allowed to have a gap of 150 mm or less if it is not continuous.

If the end of a handrail directly faces a doorway, it shall be returned to the wall (*see* Fig. 3).

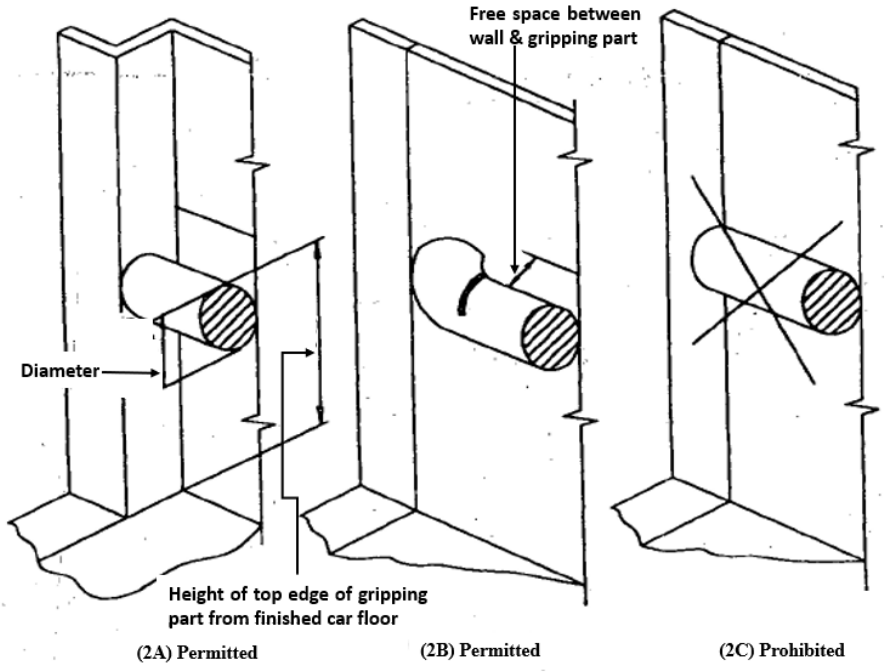

FIG. 3 POSITIONS OF HANDRAILS AT DOORWAYS

4.3.2.2 Internal walls of the car shall have a non-reflective matt finish in a colour and tone contrasting with the floor.

4.3.2.3 The floor of the lift car shall be rigid and non-reflective matt finish and shall be slip resistant to decrease the risk of stumbling.

4.3.2.4 Internal car lighting should provide minimum level of illumination of 100 lux at floor level, uniformly distributed, avoiding spotlights.

4.3.2.5 Surface materials that a user can be allergic to include nickel, chromium, cobalt and natural or synthetic rubber. These materials should be avoided in buttons, controls, handles or handrails.

4.3.2.6 *Seats* — The design of the lift car shall have provisions to retrofit a tip-up seat. Where provided, the seat and its position must not impede the normal use of the lift, neither to the person using the seat nor to other users. The seat shall have following dimensions:

a) Seat height from the floor : 500 mm + 10 mm

b) Depth : 300 - 400 mm

c) Width : 400 - 500 mm

d) Ability to support load : 100 kg

4.3.2.7 In special cases e.g. for a car size of Type 3, as given in Table 1, where a passenger in a wheelchair is unable to turn around, a device to observe obstacles when moving backwards out of the car shall be installed, for example, a mirror installed in an appropriate position. Where glass is used as mirror, it shall be a laminated safety glass.

NOTE — The lowest part of the mirror should be a minimum of 900 mm from the floor.

4.4.3 *Stopping/Levelling Accuracy* — under the intended use:

a) the stopping accuracy of the car shall be ± 10 mm; and
b) Levelling accuracy of ± 20 mm shall be maintained.

4.4 Control Device, Signals and Additional Fittings

4.4.1 *Landing Controls* —

4.4.1.1 On every landing where push button type systems are used for the operation of the lift, they shall meet the following requirements:

a) Operating force for the button shall be minimum 2.5 N and maximum 5 N.

b) Minimum area of the active part shall be 490 mm square and button shall be 20 mm minimum in the smallest dimension.

> **NOTE** — In the case of two buttons, the vertical distance between the active parts shall be more than 10 mm and the buttons shall be arranged one above the other.

c) User shall be able to know that the button has been operated, either because it possesses perceivable movement or it is provided with a system of mechanical feedback. The call registration shall be confirmed by a visible signal.

d) Height from floor level to the center line of any button shall be between 800 mm and 1000 mm.

e) Active part of the button shall be identifiable visually and by touch / acoustic from the face plate or its surroundings. Additionally, braille markings may be provided apart from raised letters.

f) Colour of any face plate of landing push button shall be contrasted to its surroundings.

g) For the benefit of wheelchair users, the minimum distance to the centre line of any of the buttons from any wall or door at right angles, shall be 500 mm.

h) Size of any symbols shall be minimum of 16 mm and maximum 40 mm, in relief with a thickness of $1\ ^{+0.5}_{-0}$ mm and contrasted to their background. Symbols shall preferably be on the active part of the button or 10 mm to 15 mm left of it. This shall be measured from the edge of the relief.

i) It should have a clear floor space of at least 900mm x 1200mm with no obstruction placed to prevent a wheelchair user from reaching it.

4.4.1.2 Where a keypad type system is used, it shall meet the requirements in Annex D.

4.4.2 *Car Controls*

4.4.2.1 Operating Panel(s) shall have the following:

a) One button for each floor (marked -2,-1, 0, 1, 2, etc) or a key pad;
b) One alarm button and intercom button (yellow with bell shaped symbol : May be linked or separate);
c) One door ‘reopen’ button (marked <|>); and
d) One door ‘close’ button (marked >|<).

4.4.2.2 Where buttons are located within the car they shall meet the following requirements:

a) Requirement of **4.4.1.1** (a), (b), (c), (e), (f), (h) and (i) shall apply;

b) Distance between the active parts of two floor buttons shall not be less than 10 mm;

c) Center line of alarm and door open buttons shall be located from the floor at 900 ± 10 mm. This applies even to the door closing buttons;

d) Lowest floor buttons shall be located above the alarm or door buttons. The vertical distance between floor buttons and alarm or door buttons shall be not less than twice the distance defined as (b) above;

e) Highest floor button shall be located at not more than 1 200 mm above the floor. When possible the highest button should be not more than 1 100 mm from the floor;

f) Order of the floor buttons, for a horizontal single row shall be from left to right. The order of floor buttons for a vertical single row shall be from the bottom to the top and for multiple rows from left to right from the bottom to the top; and

g) Button exit floor should protrude 5±1 mm beyond the other buttons (preferably green). Main entry floor should be marked with ★ whether full height COP or keypad.

h) To provide equidistant access to control panel buttons, especially for independent wheelchair users or others, the control panel shall be placed horizontally. For elevators serving building with 10 floors or above, both panels are recommended, which may be both horizontal and combination of horizontal & vertical.

i) Touch sensitive buttons or touch sensitive keypads shall be avoided.

4.4.2.3 The car control panel shall be on the side wall and located as follows:

a) With center opening doors, it shall be on the right hand side when entering the car; and

b) With side opening doors, it shall be on the closing side.

4.4.2.3 The minimum distance to the center line of any of the buttons from any wall or door at right angles shall be 400 mm.

4.4.2.4 Where keypads are used for call registration in the car, they shall meet the requirements of Annex D.

4.4.2.5 In destination control system, where a user has selected ‘Temporary Activation’, the start of the door closing shall be initiated by activating the door close button. If the car is not used, it shall return to normal operation after 30 to 60 s. This serves as an option to **4.2.3**.

4.4.3 *Landing Signals*

4.4.3.1 Where, prior to entering the car, the control system may establish the next direction of travel (collective control), the following shall be provided:

a) Two illuminated indicator arrows giving advance information on the next departure direction of the car (only one at the terminal landings) placed above or near the doors in a visible position, to indicate the direction in which the car will subsequently move.

Landing indicator arrows shall be located between 1.80 m and 2.50 m above the floor. The height of the arrows shall be at least 40 mm.

b) An audible signal shall accompany the lighting of arrows. The audible signal shall use different sounds for up and down.

1) One sound for up; and
2) Two sounds for down.

The audible signal shall have a sound level of between 35 dBA and 55 dBA adjustable to suit the site conditions with a typical recommended level of 50dBA.

4.4.3.2 The requirement of **4.4.3.1** may in case of single lift be satisfied by a device in the car visible and audible from the landing.

4.4.3.3 For lifts with destination control systems:

a) The selected floor number shall be confirmed with visual and audible signal. The visual signal shall be placed near the input device for the destination call.

b) Each lift shall individually be marked (for example, A, B, C etc.). Preferably this marking should be placed directly above the landing door. The designation marking shall have a height of at least 40 mm and be contrasted to its surroundings.

c) The allotted lift shall be indicated by a visual and audible signal. The visual signal shall be placed near the input device for the destination call.

d) Visual and audible information shall allow the lift to be easily identified.

e) The users shall visually and audibly be informed that they are about to enter the allocated car.

4.4.4 *Car Signals*

4.4.4.1 A car position signal shall be located with or above the car operating panel. The center line of the indicator shall be positioned between 1.60 m and 1.80 m from the car floor.

The height of the floor number shall be between 25 mm and 60 mm and have a contrasted colour to its surroundings.

Additional indicators, if provided, may be placed in any location.

4.4.4.2 When the car stops, a voice shall indicate the car position and door status. The sound level of the information shall be adjustable between 35 dBA and 55 dBA adjusted to suit the site conditions with a typical recommended level of 50dBA.

4.4.4.3 Battery operated/ back up emergency light, alarm and intercom preferably hands-free type, shall be provided.

4.4.4.4 The emergency bell in the lift (alarm button in car control panel) must be connected to a blinking light in the lift car to signal to person/s with hearing impairments that the emergency bell has been activated. It shall turn ON & OFF along with alarm.

4.4.5 *Temporary Activation of Features* — The features, extended door dwell time (*see* **4.2.3**) and voice announcement (*see* **4.4.3.1** (b) and **4.4.4.2**) may be activated for a single trip by a suitable device. If a button is used for this purpose, it has to meet the requirements of **4.4.1** and shall be marked with the international symbol of access.

4.4.6 *Automatic Rescue Device (ARD)* — In the event of a power failure during normal operation, a battery operated ARD shall automatically move the stalled lift to the nearest floor, open the doors, thereby facilitating rescue of the stranded passengers in the lift. The functioning of ARD should be in accordance with clause No. 5.12.3.3 of IS 17900 (Part 1).

4.4.7 *Overload Prevention Device* — The lift car shall not start when the car is overloaded. The lift operation shall resume only upon removal of the overload.

ANNEX A
(*Clause* 1)

CATEGORIES OF DISABILITIES CONSIDERED

A-1 Categories of disability are defined in Tables 2 and 3.

A-2 The disabilities in Table 2, are considered in the scope of this standard.

Excluded are all combinations of disabilities (*see* Table 3).

Excluded are disabilities with requirements not clearly related to lift functions (for example, claustrophobia). *See* Table 3.

TABLE 2 DISABILITIES INCLUDED IN THE SCOPE OF THE STANDARD

(*Clauses* A-1 and A-2)

SL NO. (1)	CATEGORY (2)	SUB-CATEGORY (3)	CHARACTERISTICS (4)
i)	Physical disability	Impaired mobility	Need for use of : a) Wheelchair; b) Walking stick; c) Crutches; d) Walking frame; e) Rollator.
ii)		Impaired endurance, equilibrium	Slow mover, poor balance
iii)		Impaired dexterity	Reduced function of upper limbs (arms, hands, fingers)
iv)	Sensory disability	Impaired vision	Blind (stick, guide dog), partially sighted, colour blindness
v)		Impaired hearing	Deaf, hard of hearing
vi)		Impaired speech	Reduced ability and inability to communicate by voice
vii)	Intellectual disability	Learning difficulty	Reduced understanding of controls

TABLE 3 DISABILITIES NOT INCLUDED IN THE SCOPE OF THE STANDARD

(*Clauses* A-1 and A-2)

SL NO. (1)	CATEGORY (2)	SUB-CATEGORY (3)	REMARKS (4)
i)	Combinations	Included disabilities	*See* explanation in clause **A-2**
ii)	Physical disability	Extreme dexterity	Upper limbs missing or paralyzed
iii)		Size related disability	Less than 1.5 m or over 2.0 m body length
iv)	Phobia	Claustrophobia	-

ANNEX B
(*Clause* 4.1.2)

WHEELCHAIR TURNING SPACE IN FRONT OF LIFT DOOR

B-1 In order for the lift to be fully accessible to all users, it is vital that a clear turning space is provided in the lobby outside the lift doors. The space should be 1500 mm x 1500 mm or 1500 mm diameter. Where it is possible to provide more space, it should be done.

Space needed is illustrated in Fig. 4, Fig. 5 and Fig. 6.

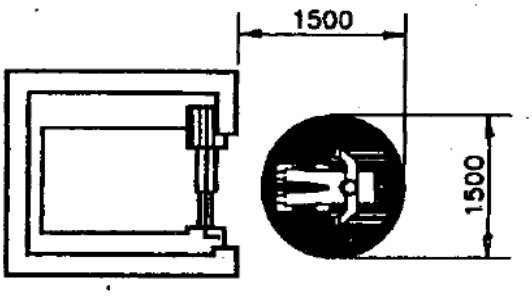

FIG. 4 SPACE FOR TURNING IN FRONT OF DOOR

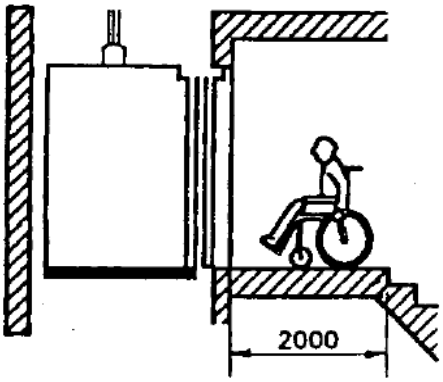

FIG. 5 SPACE BETWEEN FRONT OF LIFT DOOR AND STAIRCASE

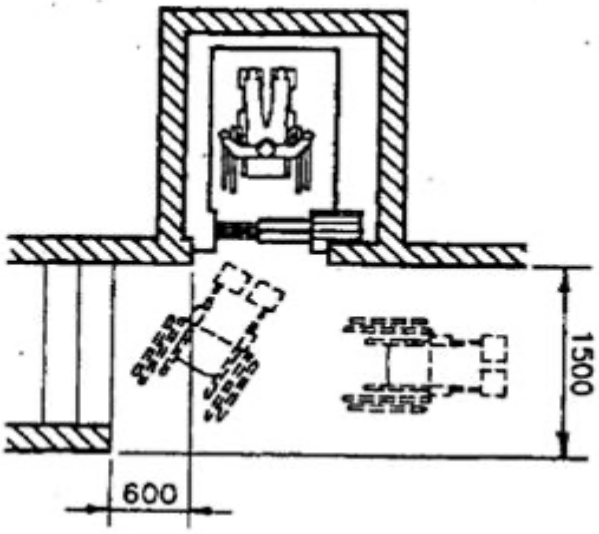

FIG. 6 SPACE BETWEEN FRONT OF LIFT DOOR AND STAIRCASE LOCATED BESIDE THE DOOR

ANNEX C

(*Table 1*)

SHAFT REQUIREMENTS FOR LIFT CARS

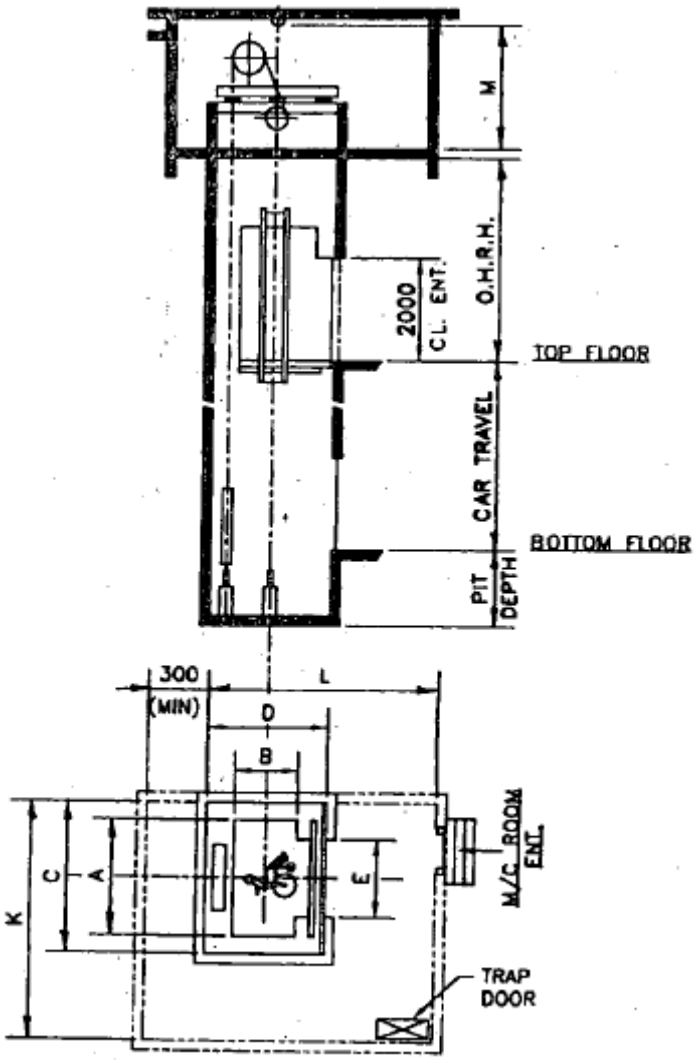

FIG. 7 SHAFT REQUIREMENTS FOR

SL NO.	LOAD		DOOR	CAR INSIDE		LIFT SHAFT		ENTRANCE	MACHINE ROOM		
	Persons	kg		A	B	C	D	E	K	L	M
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
i)	14	952	COAD	1 500	1 500	2 100	2 200	900	3 400	4 500	2 500
ii)			TLAD								
iii)	24	1 632	COAD	1 900	1 900	2 600	2 700	1 000	4 000	4 600	2 500
iv)	8	544	COAD	1 100	1 300	2 000	2 000	900	3 400	4 500	2 500
v)			TLAD			1 900					

NOTES —

Key:

i. OHRH = overhead room height,
ii. COAD = center opening automatic door, and
iii. TLAD = telescopic automatic door.

b) Pit Depth = 1 600 mm for 1 m/s and 1.5 m/s speed.
c) OHRH = 4 800 mm for 1 m/s and 1.5 m/s speed.
d) All civil dimensions as per NBC 2016 Part 8 Section 5A.
e) Lift Shaft dimensions are minimum plumb sizes. For tolerances, *see* NBC 2016 Part 8 Section 5A.
f) All dimensions are in mm, unless otherwise specified.
g) In case of public buildings (please refer note 2 in Table 1 above), the minimum car size shall be 1500 x 1500; however car size 1900 x 1900 is recommended. For residential buildings (please refer note 3 in Table 1 above), the minimum car size shall be 1100 x 1300. Any variation, on the higher side mutually agreed between the manufacturer and the purchaser are permitted within the minimum and maximum area limits specified in Table 6 of IS 17900 (Part 1).
h) Above dimensions are for Machine room type of elevators. In case of elevators without conventional machine rooms, dimensions K, L and M are not applicable.
i) The above table is valid for lift car travel up to 75 m.

ANNEX D
(*Clauses* 4.3.1.2 and 4.3.2.5)

KEYPAD

D-1 GENERAL

Keypad may be applied in the car or at the landing. The arrangement of the numbered keys shall be according to the standards telephone type, *see* Fig. 8.

D-2 DESIGN REQUIREMENT

The requirements of **4.3.1** and **4.3.2** apply with the following exceptions and additional requirements:

a) In order to be recognized as keypad, the distance between the buttons shall be between 10 mm and 15 mm. For inclined keypads, the distance may be reduced between 5 mm and 15 mm.

b) The user shall be able to know that the button has been operated, either because it possesses perceivable movement or an audible feedback. The call registration shall be confirmed by a visible and audible signal adjustable between 35 dBA and 65 dBA. The audible signal shall be given on every individual call registration even if the call is already registered.

c) The size of the floor numbers shall be minimum 15 mm, maximum 40 mm and contrasted to the background.

d) The button number '5' shall have a single tactile dot as orientation for users with impaired vision.

e) Numbers and symbols shall be on active part of the button.

f) For keypads in the car, the exit buttons (main floor) shall be clearly distinguishable from the other buttons. This shall be provided by green button protruding (5 ± 1) mm above the plane of the other buttons marked with relief star ("★").

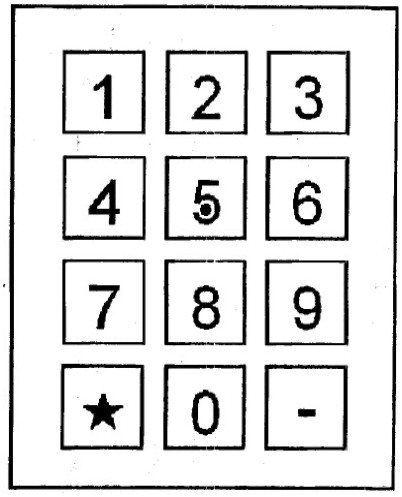

FIG. 8 ILLUSTRATION OF KEYPAD TYPE SYSTEM